

## Use of Quick Response (QR) Code Payment Gateway in Nepal: Entrepreneur's Perspective

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### Abstract

*A Quick Response (QR) code payment gateways are becoming increasingly popular in Nepalese business environments, especially in urban areas. QR Code payment facilities are available even in small business in Nepal. There were a number of factors that influenced Nepali entrepreneurs to adopt QR code payment gateways for their shops. Therefore, this paper attempts to determine what factors mainly influenced Nepali entrepreneurs to install QR payment gateways. For this purpose, the paper surveyed 200 Nepali small and medium enterprises (SME) running enterprises within Kathmandu Valley. Most Nepali entrepreneurs only implemented QR facilities a year or two ago, according to the paper. The paper also discovered that consumer factors (3.80 points on average) were a key factor among the four criteria studied. According to the regression analysis, customer and environmental factors account for 27.3 percent of QR code payment gateway adoption among Nepalese entrepreneurs.*

**Keywords:** Quick Response (QR) Code, payment, entrepreneur, Nepal.

### Background

Quick Response (QR) Code is closely tied to the retail industry, which grew in Japan throughout the 1960s. Masahiro Hara of the Japanese company Denso Wave devised QR code technology in 1994 after a salesperson encountered problems with barcode payment settlement (Herawati & Rahmaan, 2019). QR Code is capable of handling all types of data, such as numeric and alphabetic characters, various languages, symbols, binary, and control codes. Up to 7,089 characters can be encoded in one symbol. A QR code can have the same amount of information as a standard bar code, but it takes up about a tenth of the space. Error rectification is possible with QR codes. Even if the symbol is partially destroyed or unclear, data can still be recovered. 30 percent of the codewords can be recovered at most. Because QR

codes can read in all directions (360 degrees), they can read data quickly, steadily, and without error. The superiority features of QR Code over barcode has increase the popularity in use for payment gateway. Hence, in March 2011, Bitcoin initially used QR Code payment gateway featuring the ability to send and receive payments. Later that year, Alipay, a Chinese company created the QR code payment system, enabling offline partner stores to instantly accept payments by scanning a customer's QR code stored in Alipay Wallet (Zhu & Li, 2018).

The increase in interest in digital payment among Nepalese consumers has also boosted QR payment in the Nepalese market. Digital payment gateways have provided solutions that offer new revenue and value-adding opportunities to organizations (Antonucci et al., 2020; Hoch & Brad, 2021; Kazan et al., 2018), especially for Small and Medium Enterprises (SMEs) in developing countries.

As the number of smartphone and iPhone users increases, mobile wallet payment also starts to increase. Agrawal et al. (2019) in a study in Singapore found that the introduction QR among customers and entrepreneurs boosted the sales of small merchants. The sales volume was further enhanced that used to be with the introduction of card payment, in the context of QR payment introduction in Singapore.

Following the outbreak of the COVID-19 pandemic, the global relevance of digital payments increased. Cao (2021) discovered that business variables, technology competencies of Chinese SMEs, and the environment all had a beneficial impact on mobile payment uptake. Consumer intent has almost no influence on mobile payment acceptance.

Chaveesuk and Piyawat (2021) discovered that Thai entrepreneurs with varying business operation time, monthly business income, and capital investments had no intention of employing QR code technology.

According to Pratiwi (2022), the Quick Response Payment System implementation in Indonesia has had a favorable impact on the business development of small and medium firms. The availability of QR digital payment methods promoted the acceleration of the payment transaction process, faster recording of business outcomes, and up-to-date business procedures to attract more customer spending power with various payment conveniences.

Similarly, Wahyudin et al. (2022) partially showed that e-commerce and Quick Response Code Indonesia Standard (QRIS) positively and significantly affected sales performance and competitive advantage among the Indonesian Micro, Small and Medium Enterprises (MSME).

He et al. (2023) discovered barriers to QR payment gateway usage among China's elderly street merchants. The report identified noisy environments and impaired hearing as major barriers to QR payment settlements among street vendors. When mobile payment-based fraud target both confirmation interfaces (e.g., phony sounds of successful payment) and trust systems (e.g., showing half-done proof to flee without paying) in street selling, transaction security vulnerabilities arise.

In terms of India, Malla Reddy (2023) believes that the majority of street sellers are adopting digital payment systems due to client influence, self-motivation, simple access to bank accounts, and so on. Even if digital payment systems are being used, the bulk of clients are still paying in cash. It was also discovered that network troubles, amounts not being credited promptly, no immediate message alerts and high speaker prices are some of the issues and challenges that street vendors experience.

As earlier stated, the increasing use and popularity of QR payment gateways among the Nepalese entrepreneurs and customers, the central bank of Nepal, Nepal Rastra Bank issued the NepalQR Standardization Framework and Guidelines, 2020 in December 2020. The guideline is focused on the

Interoperability, Scalability, and Security of the QR settlement. Hence, in this backdrop, the paper tries to get opinions from the perspective of Nepalese entrepreneurs regarding the use of QR in their business.

## Methods

The paper follows the correlation research design to achieve an objective. All the small entrepreneurs who have been operating niche businesses within the Kathmandu Valley, i.e., Kathmandu, Lalitpur, and Bhaktapur, are considered the population for the paper. Among them, only entrepreneurs who have kept the Quick Response (QR) payment facility in their shops are considered samples for the study. Hence, a purposive sampling technique has been adopted to collect the data. A sample of 200 entrepreneurs was taken to gather opinions as per the objective of the paper. A field survey was done to collect the data.

The paper used a five-point Likert scale-based questionnaire to get opinions from the sampled Nepalese entrepreneurs. A score of '1' was allotted for 'least importance' and '5' for most importance'. The questionnaire has four factors that made entrepreneurs adopt quick response (QR) payment gateways and opinions on use intentions among entrepreneurs. A questionnaire was adopted from Cao (2021) to fulfill criterion-related validity. Similarly, Cronbach's alpha was run for the reliability of the instrument after the pilot study among 50 entrepreneurs. A total of 29 items were used under four factors and use intentions of QR. After the reliability test, three (3) items dropped with an alpha value of 0.922. The items dropped after the reliability test were "cost of QR adoption," "education level of entrepreneurs and employees" and "reliable software applications." Further, descriptive statistics and regression analysis were conducted to find out the intention to use QR among Nepalese entrepreneurs.

## Data Analysis

### *Respondents' Profile*

The following section depicts the profile of the respondents:

#### *Gender of the Respondents*

The table below shows the composition of respondents by gender:

**Table 1**

#### *Gender of the Respondents*

<b>Gender</b>	<b>No. of Respondents</b>	<b>Ratio (in percent)</b>
Male	131	65.5
Female	69	34.5
<b>Total</b>	<b>200</b>	<b>100.0</b>

*Source: Field Survey, 2023*

Of the total respondents, the majority (65.5 percent) are male, and the remaining are female.

**Table 2**

#### *Age Group of the Respondents*

<b>Age Group</b>	<b>No. of Respondents</b>	<b>Ratio (in percent)</b>
Below 20	4	2.0
20-30	61	30.5
30-40	72	36.0
40-50	46	23.0
50-60	16	8.0

60 and above	1	0.5
<b>Total</b>	<b>200</b>	<b>100.0</b>

*Source: Field Survey, 2023*

The majority (36.0 percent) of the respondents are from the age group of 30–40, followed by the age group of 20–30 years. The least representation was from the age of 60 and above.

**Table 3**

*Education Level of the Respondents*

<b>Education Level</b>	<b>No. of Respondents</b>	<b>Ratio (in percent)</b>
Illiterate	15	7.5
Below SEE	11	5.5
SEE	33	16.5
SLC (+2)	42	21.0
Bachelor	73	36.5
Master	25	12.5
M.Phil.	1	0.5
<b>Total</b>	<b>200</b>	<b>100.0</b>

*Source: Field Survey, 2023*

The highest number of respondents had a bachelor's degree, covering 36.5 percent, followed by SLC (+2), covering 20 percent. Only a single entrepreneur had an M.Phil. degree.

**Table 4**

*Business Sector of the Respondents*

<b>Business Sector</b>	<b>No. of Respondents</b>	<b>Ratio (in percent)</b>
Grocery	38	19.0
Restaurant/Café/Bakery	30	15.0
Boutique and Clothing	18	9.0
Hardware/Electronics/Furniture	18	9.0
Pharmacy	13	6.5
IT and Mobile Repair	9	4.5
Consultancy and Manpower	8	4.0
Dairy	8	4.0
Education	7	3.5
Handicraft and Curio	7	3.5
Stationery	7	3.5
Juice and Paan Shop	6	3.0
Liquor Shop	4	2.0
Meat Shop	4	2.0
Barber and Parlor	4	2.0
Shoes Shop	4	2.0
Ceramic	3	1.5
Jewelry	2	1.0
Photo Studio	2	1.0
Optical Shop	2	1.0
Clinic	2	1.0
Cosmetic	2	1.0
Toy Store	2	1.0

<b>Total</b>	<b>200</b>	<b>100.0</b>
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*Source: Field Survey, 2023*

Respondents from 23 different sectors of small enterprises have participated, among which entrepreneurs who have been operating grocery stores have the highest number, covering 19 percent of the total respondents.

### ***Duration of QR Code Adoption***

The table below shows the duration of the QR code payment gateway adopted by the sampled entrepreneurs in their businesses:

**Table 5**

### ***Duration of QR Adoption***

<b>Duration</b>	<b>No. of Respondents</b>	<b>Ratio (in percent)</b>
Below six months	13	6.5
Six months to 1 year	40	20.0
1-2 years	62	31.0
2-3 years	42	21.0
3-4 years	25	12.5
4-5 years	10	5.0
5 years and above	8	4.0
<b>Total</b>	<b>200</b>	<b>100.0</b>

*Source: Field Survey, 2023*

Table 5 shows that the use of QR code payment gateways among Nepalese entrepreneurs is new. Of the total respondents, only 4 percent of them have been using QR for 5 years and older. The highest number of entrepreneurs (31 percent) have adopted QR for one to two years, followed by users for two to three years, covering 21 percent.

### ***Descriptive Statistical Analysis of the Factors that Affect in Use of QR***

This section analyzes the factors that led Nepalese entrepreneurs to use a quick response (QR) code payment gateway.

#### ***Business Factors***

**Table 6**

### ***Opinion on Business Factors***

<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Skewness</b>	<b>Kurtosis</b>
Business readiness determines to adopt QR.	3.77	1.10	-0.63	-0.33
Type of business determines to adopt QR.	3.62	1.17	-0.45	-0.74
Efforts needed to adopt QR.	2.87	1.20	-0.01	-0.93
<b>Overall Average</b>	<b>3.42</b>			

*Source: Field Survey, 2023*

On average (3.42 points), business factors were seen as important for entrepreneurs to adopt QR. Business readiness (3.77 points) was seen as the most important reason to adopt QR by Nepalese entrepreneurs.

### *Technological Competence Factors*

**Table 7**

#### ***Opinion on Technological Competence Factors***

<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Skewness</b>	<b>Kurtosis</b>
Security level of transaction in QR gateway.	3.63	1.09	-0.48	-0.42
Technological level of payment facilities.	3.55	1.11	-0.45	-0.34
Availability of internet connectivity and speed.	3.52	1.17	-0.55	-0.47
Network connection among payment partners.	3.51	1.12	-0.46	-0.47
Compatibility of payment facilities available.	3.47	1.02	-0.34	-0.22
<b>Overall Average</b>	<b>3.53</b>			

*Source: Field Survey, 2023*

The security level of transactions in QR gateways was seen as the most important (3.63 points) under the technological competence factors.

### *Environmental Factors*

**Table 8**

#### ***Opinion on Environmental Factors***

<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Skewness</b>	<b>Kurtosis</b>
Cooperation from telecom providers and banks.	3.61	1.11	-0.27	-0.21
Perceived public awareness and compatibility.	3.55	1.11	-0.44	-0.45
Regulatory policies and support by the government.	3.23	1.28	-0.18	-1.08
ICT infrastructure level in Nepal for QR gateway.	3.10	1.04	-0.34	-0.23
Language options available and literacy.	3.04	1.29	0.11	-1.04
Pressure from competitors and stakeholders.	2.79	1.22	0.26	-0.89
<b>Overall Average</b>	<b>3.22</b>			

*Source: Field Survey, 2023*

Cooperation from telecom providers and banks was seen as the most important factor under the environment factor, while pressure from competitors and stakeholders was seen as the least important (2.79 points).

### *Consumer Factors*

**Table 9**

#### ***Opinion on Consumer Factors***

<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Skewness</b>	<b>Kurtosis</b>
Relative advantage to use QR gateway.	4.05	0.99	-1.07	0.98

Perceived ease and usefulness of QR gateway.	3.83	0.94	-0.18	-1.03
Perceived trust and security.	3.83	0.97	-0.50	-0.15
Consumers' readiness to use QR gateway.	3.82	1.08	-0.29	-1.27
Familiarity and complexity to users.	3.68	1.11	-0.45	-0.56
Use of electronic payment.	3.62	1.15	-0.42	-0.72
<b>Overall Average</b>	<b>3.80</b>			

*Source: Field Survey, 2023*

Nepalese consumers are seen as eager to use QR payment gateways for a relative advantage over cash transactions, with an average score of 4.05 points.

#### *Use Intention of QR among Entrepreneurs*

**Table 10**

#### *Opinion on the Use Intention of QR among Entrepreneurs*

<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Skewness</b>	<b>Kurtosis</b>
Transactions can be completed quickly and safely.	4.07	0.99	-0.94	0.40
Reduce risk of theft of cash and account settlement time with proper record.	4.05	1.16	-0.87	-0.14
No need to hold excess cash.	3.85	1.21	-0.85	-0.21
No need for physical interaction with customers.	3.82	1.31	-0.78	-0.55
Improve competitive advantage.	3.72	1.00	-0.59	-0.08
Enhance sales performance and profitability.	3.65	1.01	-0.36	-0.45
<b>Overall Average</b>	<b>3.86</b>			

*Source: Field Survey, 2023*

Nepalese entrepreneurs adopted the QR payment gateway mainly for quick and safe completion of transactions, with the highest mean score of 4.07 points. The entrepreneurs were not convinced that adopting QR payment gateways could enhance sales performance and business profitability.

#### *Normality Test of Factors and Use Intention*

**Table 11**

#### *Normality Test of Factors and Use Intention*

<b>Factors and Use Intention</b>	<b>Kolmogorov-Smirnov<sup>a</sup></b>		<b>Shapiro-Wilk</b>	
	<b>Statistic</b>	<b>Sig.</b>	<b>Statistic</b>	<b>Sig.</b>
Business Factors	0.146	0.0000	0.956	0.0000
Technological Competence Factors	0.091	0.0000	0.981	0.0080
Environment Factors	0.079	0.0040	0.985	0.0320
Consumer Factors	0.067	0.0280	0.969	0.0000
Use Intention	0.138	0.0000	0.946	0.0000

<sup>a</sup>*Lilliefors Significance Correction*

Table 11 shows all the factors and use intentions are normally distributed.

### *Regression Analysis Result*

The table below shows the result of regression analysis among the variables used in the paper. The results also clarify the exact use intentions of the QR gateway by the Nepalese entrepreneurs.

**Table 12**

#### ***Summary Result of Regression Analysis***

<b>Variables</b>	<b><math>\beta</math></b>	<b>T</b>	<b>p-value</b>	<b>VIF</b>
(Constant)	1.735	7.012	0.000	
Consumer Factors	0.359	5.130	0.000	1.398
Environment Factors	0.236	3.242	0.000	1.398
R-Square	0.280			
Adj. R-Square	0.273			
F-Statistics	38.16			
	(0.000)			
Durbin-Watson Statistics	1.486			

*Dependent Variable: Use Intention*

Regression analysis presented in Table 12 shows that only consumer factors and environment factors influence the use intention of QR code payment gateways by Nepalese entrepreneurs. The result shows that 27.3 percent of QR code payment gateway use among Nepalese entrepreneurs is due to consumer and environmental factors. As the F-statistics are significant, an overall model is also statistically significant. Table 12 also shows that business factors and technological factors are not influencing the use of QR code payment gateways among Nepalese entrepreneurs.

### **Conclusion and Implications**

Quick Response (QR) payment gateway has been a part of small and medium enterprises operating in city areas of Nepal. After proper guidelines from the central bank, the popularity of QR payments has further increased in Nepal. At the same time, a decline in internet costs and an increase in the use of smartphones and iPhones among Nepalese consumers have boosted the use of QR payment gateways. As a certain portion of Nepalese consumers in the big city urged to go cashless, entrepreneurs are also forced to install QR payment gateways in their businesses.

The paper has found that Nepalese entrepreneurs with different backgrounds running a variety of small businesses that are based on just carts to proper shops have installed QR payment gateways. It was also found that the installation of QR payment gateways in shops has increased since the pandemic broke out in Nepal. Hence, the majority of Nepalese entrepreneurs started QR facilities just a year or two ago. The paper also found consumer factors (3.80 points on average) as a major factor on average among the four factors that were considered in the study.

Similarly, from the regression analysis, 27.3 percent of QR code payment gateway use among Nepalese entrepreneurs is due to consumer and environmental factors. This also shows the demand from Nepalese consumers, and the changing business environment has forced Nepalese entrepreneurs to use QR code payment gateways in their shops.

With the continuous digital change in the urban areas of the Nepalese payment scene, QR codes can be an effective tool. Due to their versatility as a point of contact between customers and businesses, as well as their ability to facilitate 'new retail' and mobile lifestyle use cases that seamlessly combine in-person and virtual experiences, they have the potential to accelerate the acceptance and use of mobile payments.

Finally, the increasing popularity of QR code payment gateways has also raised some issues among Nepalese entrepreneurs. One of the concerns is providing internet facilities within the shop premises. Similarly, delay in settlement of transactions has made the continuity of QR facilities questionable, as per the Nepalese entrepreneurs. However, an introduction to ‘AudiQR’ in Nepal has settled an issue of language barriers and confirmation notice of the amount deposited through a voice message through a QR reading device to the vendor or entrepreneur.

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