

The Istanbul Post

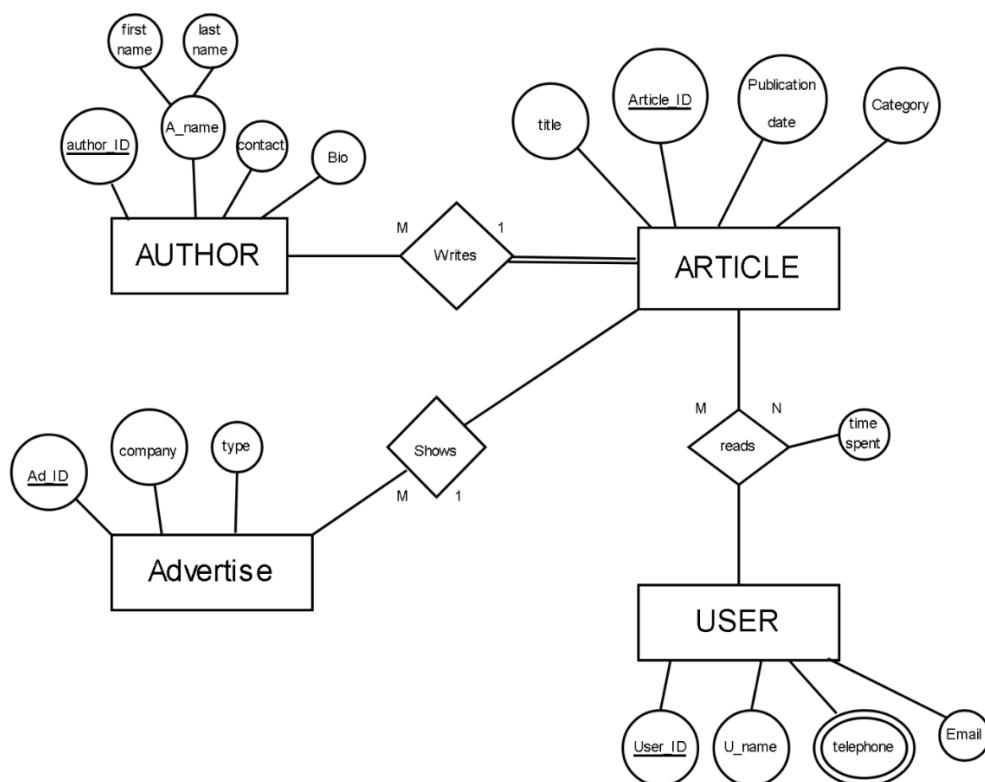
Introduction

The Istanbul Post is an online newspaper that publishes and distributes news articles and other forms of journalism over the internet. We produce original content as well as republish content from other sources. Our business model involves selling subscriptions to readers and displaying advertisements on our website. We also generate revenue through sponsored content and partnerships with other companies. By organizing and distributing high-quality journalism, we aim to inform and engage our readers while also providing value to our advertisers and partners. We continuously strive to improve and grow our business by carefully analyzing website traffic and user engagement data.

Design:

- **Articles table:** This table contains information about the articles that are published, including the title, author, publication date, category and the AD displayed.
- **Authors table:** This table contains information about the authors who contribute to the online newspaper, such as their name, contact information, and a brief bio. A one-to-many relationship is established between the Authors and Articles tables using a foreign key in the Articles table that points to the primary key of the Authors table. This allows each author to be related to multiple articles, while each article is related to only one author.

- **Users table:** This table contains information about the readers who subscribe to the online newspaper, including their name, email address, telephone number. A many-to-many relationship is established between the Users and Articles tables with time spent attribute which points to how much the user spent time reading the article using a foreign key in the Articles table that points to the primary key of the Users table. This allows each user to read multiple articles, while each article is read by multiple users.
- **Advertise Table:** This table contains Advertise information including company that advertise with the online newspaper, type of the AD. A 1 to many relation is established to connect the AD with the article and checking the duration of the AD in the article.



ARTICLE

<u>Article_id</u>	title	Publication date	category	Author_id	Ad_id
122	Ice and fire	2022-5-1	nature	107	554
123	Rome	2021-3-2	travel	108	552
124	Science and life	2019-1-1	Science	109	554
125	GPU vs CPU	2020-9-8	engineering	109	553
126	RAM vs ROM	2021-8-8	engineering	111	553

AUTHOR

<u>author_id</u>	A_name	contact	Bio
107	James.W	5522452	xxxxxyxyx
108	Alice.D	5466546	yyxyxyxyx
109	Dallen.A	5546466	xxxxxxxxxxx
110	Hamza.S	1122336	yuyyyyyyy
111	Jake.O	1659789	edrtfyguhij

USER

<u>User_id</u>	U_name	email
1535	Hamza	wvjw@svgs
1536	yaman	sbds@hsjb
1537	jake	dfgvh@sgv
1538	Ali	xxx@yyy

READS

<u>UserId</u>	<u>ArticleID</u>	hours spent
1535	123	3
1538	126	1
1535	124	0.5
1538	123	2

USER-TEL

<u>UserID</u>	<u>Telephone</u>
1535	1122121
1536	1213313
1537	151515
1535	1515151

ADVERTISE

<u>AD_ID</u>	company	type
551	apple	technology
552	wego	travel
553	nestle	health
554	safari	education

* Since WRITES and SHOWS are 1:M relations, we can make implicit implementation

keys and cardinalities

relational schema:

AUTHOR (author_id, a_name, contact, bio)

- Author_id is the primary key

- a_name is composed to one attribute to make it atomic

ARTICLE (article_id, title, publication-date, category, Author_id, Ad_id)

- Article_id is the primary key of the table, the attributes are title, publication-date and category.
- Author_id is a foreign key for the primary key of AUTHOR table, and since WRITES is 1:M we can make implicit implementation by add it to ARTICLE table.
- Ad_ID is a foreign key for ADVERTISEMENT table, and since SHOWS is 1:M we can make implicit implementation and add it to ARTICLE table.

ADVERTISE (Ad_ID, company, type)

- Ad_ID is the primary key

USER (user_id, u_name, email)

- User_id is the primary key

USER-TEL (user_id, telephone)

- Since telephone is a multivalued attribute, a new table must be made
- User_id and telephone both acts like primary keys

READS (user_id, article_id, time-spent)

- Since READS is M:N, we can't make implicit implementations here user_id and article_id are both primary because they uniquely determines time-spent
- User_id is a foreign key from USER and article_id from ARTICLE tables

Cardinality:

WRITES: 1:M because an author can write multiple articles and an article is written by only one author. this relation can be implemented implicitly

SHOWS: 1:M because an AD is shown to multiple Articles and an Article shows only one AD. this relation can be implemented implicitly

READS: M: N because the user can read multiple articles and an article has multiple readers. This cant be implemented implicitly because it will cause redundancy, so it stays.

NORMILZATION

1NF:

To make tables in 1NF , the domain of every attr must be atomic and a single value (no composite or multivalued). Here Name attr in AUTHOR is composed to just name to make it single value. and Telephone attribute from the USER table is put to another table called USER-TEL

2NF:

All tables are in 1NF , all non-prime attributes are fully dependent on the primary key therefore no partial dependency occurred, so no change is done. Its already in 2NF.

3NF:

All tables are in 2NF, all non-prime attribute are dependent by prime attributes therefore no transitive dependency. Its already in 3NF

3.5 NF:

All tables are in 3 NF, no non-trivial dependencies. Its already in 3.5 NF.

4NF:

All tables are in 3.5NF and no multivalued dependencies. its already in 4NF.