Our Names in the Computing Age

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Contents

1 Introduction

In this paper, we will explore how digital information storage is transforming personal names; naming practices are a facet of culture tied up with the Com-

puting Age. By naming practices, we mean patterns and norms of a culture that govern use of linguistic tokens for identifying self and others. The forms of personal names and customs by which they are acquired vary immensely across time and space; yet in a world powered by SQL queries, a fluid, variable, or context-dependent naming system is anathema to the desire of governments and organizations to accurately identify individuals on a massive scale. In other words, the importance of digital records to the modern functioning of powerful institutions is enforcing the norm that whatever name you choose, it must be compatible with the computer infrastructure used by the insitutions. Although the ability of computers to represent a wide (linguistic) array of textual content has improved greatly in recent years with standards such as Unicode, it is still incomplete. Large amounts of software rely on legacy standards (ASCII, for example, especially in USA) and if there's no pressing need to update, often the funds are not spent to improve representation. Other factors that may inhibit a name's use with computers is excessive length, symbolic content, or context dependence.

How are people affected when their name doesn't "play nice" with the computer? We will look at several cases of people whose names could not be properly represented in digital form because of length, character limitations, etc and how they are denied equal access to government documents and/or services. How do the persons feel about possibly changing their names for the convenience of administrative technology? How willing are governments or companies to rectify the situation? These are issues at the crux of the modern discourse on how to balance administrative efficiency with respect for human dignity; in short, how to stave off alienation in a digital world.

First, we'll review the worldwide diversity of naming customs and consider what sociological functions are played by a name's contents. Then we will examine the impact of computing on personal names. This entails examining some "bizarre news" cases, in which people's names do not "play nice" with a computer system, but also prompts more serious questions, such as how digital institutions are reshaping personal and cultural identities, and whether persons' names in developing countries are adequately supported by current digital infrastructure. Finally, we evaluate strategies and efforts to ensure that computer systems can support as broad a spectrum of the world's names as possible and that new technologies will preserve and protect a person's unique identities. We will consider each of the following research questions:

- How do computers influence the form that personal names may take?
- How can computers impact personal and cultural identities?
- How can we protect the social content of names in developing countries and/or among minority-language speakers?

2 Names

> You see, to some people in the world, your name is everything. If I say my name to an elder Hawaiian (kupuna), they know everything about my husband's family going back many generations…just from the name. [11]
>
> (Janice "Lokelani" Keihanaikukauakahihuliheekahaunaele)

¿Cómo se llama? This first question any language student must ask may not have such an easy answer. Names carry a spectrum of data about the bearer, be it religious, cultural, linguistic, national, or otherwise. My own name, Gaberiel, is a misspelled Biblical name with some Romantic flair. Never mind that I am neither religious nor particularly Romantic. The semantic relation between a name and the bearer is hardly one-to-one; but then, what assumptions do we make about someone named Wang Xiaoqin?

Nearly all human beings have at least one name. Naming is accepted by ethnographers as a cultural universal, as in no society has been found which does not assign linguistic tokens for reference to specific individuals [**alford88**]. Article Seven of the Convention on the Rights of the Child even codifies a person's fundamental right to a name: "The child shall be registered immediately after birth and shall have the right from birth to a name." [3]

2.1 Functions of a Name

Why do we give people names? Let's divide naming functions into *reference* and *symbolic* functions, categories which we will subdivide further below.

2.1.1 Reference Functions

Consider a table containing one row for every person with whom you are acquainted. You store everything you know about the person in their database row: nationality, appearance, favorite foods, pet peeves, etc. But faced with this vast set of data, each row (person) needs to have one relatively unique identifier (key in database terminology) by which we can access their entry and retrieve the other fields. (Using hair color, for example, would be a poor choice. "Brown hair" does not narrow our search to a single individual.) A personal name is such a token by which we single out a specific individual, a making reference to the larger concept of a given human being.

The reference function of a name does not depend on the name's content; any unique or nearly unique token allows us to navigate the database. It is not clear that "John" is a more effective identifier than "12345678"; indeed the latter seems more likely to be unambiguous. As Scott, Tehranian, and Mathias [9] notes, "serial numbers" are an administrator's dream. Of course, they are too

obscure for daily use, but institutions have worked nonetheless to make personal names more legible. Scott, Tehranian, and Mathias [9] argue that this need for "legibility" a primary explanation for the standardized use of patrilineal family surnames by modern states. For example, modern surnames were adopted by Norman élites following the conquest in order to emphasize their property holdings. Elsewhere, in Turkey, modern surnames were only adopted in 1934 under the modernising régime of Atatürk [9].

> The rise of the permanent patronym is inextricably associated with those aspects of state-making in which it was desirable to distinguish individual (male) subjects: tax collection (including tithes), conscription, land revenue, court judgements, witness records, and police work. ([9])

Thus we can see digital recordkeeping of persons and places as the next step in the streamlining of "social information". Institutions are able to organise and manipulate data about people with unprecedented efficiency, but this requires standardisation of the data to make it consistent. But the more people's names are shoehorned into a database-friendly format, there is vast social information and expressive content being lost, especially if someone's name must be altered simply to be stored in the digital format.

2.1.2 Symbolic Functions

The symbolic function of a name is played by the name's content itself; the complex of information that the linguistic form conveys, be it genealogical, cultural, linguistic, religious, etc. This is the function that, in a sense, digital records seek to eliminate, as it is fluid and ephemeral, whereas computers require for complete unambiguity.

We can subdivide a name's symbolic functions into two aspects that must be balanced; they sit on a spectrum between what Finch [6] calls individualizing functions and connecting functions.

Individualizing functions are those aspects of a name which make a statement on the individual themselves. The clearest manifestation of this is the choice of a child's forename; indeed this makes more of a statment on the parent than the child itself. "In selecting a name (especially for a first-born child) parents are not only determining the personhood of their child but are also taking a key step in defining their own new identity as parents." [6, p. 718] Hence a parent can name their child something "beautiful" like "Isabella" or something "strong" like "Samson".

> "Call him Voldemort, Harry. Always use the proper name for things. Fear of a name increases fear of the thing itself." [**rowling97**]
> (Albus Dumbledore)

Connecting functions are facets that locate the individual within a larger milieu. Most basically this takes the form of surnames, which in Anglophone societies identify the paternal family unit to which the individual belongs. "The construction of a name, and its uses through a lifetime, also can embody a sense of connectedness with family - with the parents who gave the name, and with others in a domestic arrangement or a kin network with whom all or part of the name is shared." [6, p. 711] We can find more subtle connecting functions, however. Choosing a first name after an older ancestor connects you to a more specific family relationship. And even the linguistic or religious connotations carried within the first or last name can connect a person to or set them apart from the dominant society in which they live.

2.2 A Survey of the World's Names

The form and contents of people's names vary immensely around the world. Anglo-American practice entails two given names, the "first" and "middle" names, being appended to a patrilineal surname. In many Hispanophone cultures, a child receives both a patrilineal and a matrilineal surname, and the father's surname taking precedence in terms of identification. An Icelandic surname consists of the father's given name with the attached suffix -son or -dottir, depending on gender. A similar practice occurs in Pakistan, but without any suffixation on the father's given name. In South India many people have have three names, a personal name, a family name, and a village name.

The ordering of a name's elements also varies. East Asian and Hungarian names reverse the Western order, putting the given name after the family name. Standard Chinese given names consist of two characters, whose meanings may or may not be interconnected (Emma Woo). Wardhaugh [10] cites data from **evans-pritchard48** regarding Sudan's Nuer people: Nuers receive both a paternal and maternal given name, a ceremonial clan name, and take for themselves an "ox name" from a favorite domestic animal.

Even from a brief overview, it is clear that great diversity exists in names worldwide; but we should not view each one as a static system. Instead, a naming culture constitutes a space of social rules and expectations which allow for cultural expression thru individual acts. On one end, a name can be used to locate the individual within a subgroup of the society, due to the name's linguistic, cultural, or religious connotations. For example, religion has been an important influence on naming; bearing a Christian or Islamic name marks someone as a likely member of that religious group. The linguistic origin of a name may also convey information. People often ask the origin of my last name, DeFreitas, which comes from Portuguese, a language I do not speak or have any ancestral connection to. In other cases, a name's origin may alert you successfully to the bearer's ancestry. In Kenya, we find the Giriama group, whose clan name system identifies not only the bearer's clan, but also provides information about the bearer' generation and birth order within the clan **parkin89**.

Asking the cómo-se-llama in Western context presupposes a fixed answer. Imagine the IRS' dismay if Walter demanded that he should addressed as Jean-Pierre for the entirety of 2020. (It is, after all, a leap year.) The IRS would cease to function if it had to honor such naming practices for 320 million citizens. Administrative convenience, as Scott, Tehranian, and Mathias [9] finds, has been the primary factor promoting the spread of fixed legal names and hereditary surnames. For example, in England, surnames were first adopted by the landed Norman élite. As the bureaucracy strengthened and middling types aspired to emulate their status. The practice spread down the social ladder and by the end of the 18th century had reached all parts of Great Britain. An accelerated programme as such occurred in Turkey starting in 1934 under the Westernising régime of Atatürk.

2.3 Digital Names

This paper explores a modern tension between the name's reference and symbolic function: computers. As the world has become computerized and the world's information stored in databases, a name cannot remain the sole property of its owner; it must facilitate interaction with the wider world as a means of address. If a name affirms your status as an individual, it no less affirms your status as a citizen of your country, resident of your city, customer of your electric service provider, holder of your credit card, employee of your company, and recipient of your parking ticket. A name is worth nothing if others people in the environs cannot pronounce it, write it, or remember it.

2.4 Computers

As we can see, fixed legal names are not a fact of life; they are a construction. In many non-industrialised societies, we find that naming is fluid and context-dependent. For example, the Giriama…

Fluid naming practices presuppose relative familiarity and the sharing of social context. Such practices cannot withstand a growing bureaucratic presence; governments need a "synoptic" view of their populations [9].

Today, computers are making the synoptic view ever more crystal clear for decision makers, providing precise and updated information from all parts of the Empire. On top of the requirement of a fixed legal name, it is now expected (if not mandated) that the name be compatible with institutional systems of digital record-keeping. This is the name that will go on your birth certificate, your passport, your driver's licence, your social security card; it is the name that makes you You.

The "digital age" (to be fair, we should include the impact of typewriters as well) has changed writing from an analogue and freeform practice to one based

on combinations of discrete and fixed glyphs. Since most early development of computers took place in the United States, English gained a natural ascendancy over other languages in the field of digital communication. English, perhaps as a coincidence, is also one of the easiest languages to represent in code, requiring at the bare minimum just the 26 non-accented characters of the English alphabet, perhaps with some punctuation and numbers. The ASCII standard encoding, with 127 available code points, is more than enough to represent the English language in digital form. Thus, organizations which deal only infrequently with non-English text have been slow to update their databases to Unicode standards.

3 Unicode

3.1 Computers and Writing Systems

The unfortunate truth is that your computer can only read, write, or think in 1s and 0s. That mean any text a computer deals with must somehow be stored as a number; encoding schemes describe how the computer should convert this number into a string of characters or vice versa. All computers on a network must adhere to the *same* encoding system, lest streams of text be interpreted incorrectly and communication failures ensue.

The American Standard Code for Information Interchange (ASCII), a 7-bit encoding scheme, was released in 1963 and quickly became the worldwide standard for digital text encoding. It was even endorsed by President Lyndon Johnson, who ordered in 1968 that all federal government computers must be ASCII-compatible. This was a easy decision for the US President, as the 128 (2^7) characters in ASCII included all necessary symbols to represent modern English text.

USASCII code chart

Row	0	1	2	3	4	5	6	7
0	NUL	DLE	SP	0	@	P	`	p
1	SOH	DC1	!	1	A	Q	a	q
2	STX	DC2	"	2	B	R	b	r
3	ETX	DC3	#	3	C	S	c	s
4	EOT	DC4	$	4	D	T	d	t
5	ENQ	NAK	%	5	E	U	e	u
6	ACK	SYN	&	6	F	V	f	v
7	BEL	ETB	'	7	G	W	g	w
8	BS	CAN	(	8	H	X	h	x
9	HT	EM	)	9	I	Y	i	y
10	LF	SUB	*	:	J	Z	j	z
11	VT	ESC	+	;	K	[	k	{
12	FF	FS	,	<	L	\	l	|
13	CR	GS	-	=	M	]	m	}
14	SO	RS	.	>	N	^	n	~
15	SI	US	/	?	O	_	o	DEL

The problem arose when computer technology spread beyond the labs of Silicon Valley and government offices in Washington. In other countries and languages,

there was a vast array of linguistic forms, including diacritical marks, right-to-left scripts, and pictographic writing systems, which ASCII was unequipped to handle. In the 1990s, many national encoding schemes were created to represent languages other than English. Most of these were 8-bit "extensions" of ASCII of 256 characters (2^8) , meaning the original 128-character ASCII set remained intact, and useful non-English characters were added in the remaining slots. The only problem here is that they were not intercompatible, meaning that documents might not "play nice" when transferred between countries or languages.

Unicode and its dominant encoding scheme UTF-8 intend to alleviate these problems by collecting all of the world's glyphs into one system. The 127 characters in ASCII are represented using the same single-byte codes, which means that no conversion for existing ASCII files is necessary, and these will not become bloated in a new conversion scheme. But the encoding scheme takes advantage of modern computer's greater storage capacities to represent 1,112,064 distinct characters.

4 California

American law holds the naming of children to be the right and responsibility of parents, without shutting the door on regulating edge cases, like "Ghoul Nipple", "Legend Belch", "Brfxxccxxmnpcccclllmmnprxvclmnckssqlbb11116", and "" [7]. Many American state governments abridge this right with reference to diacritical marks letters, hardly an edge case in many languages around the world. Larson [7, p. 5] investigates this in his study of American naming law, finding California, Massachusetts, New Hampshire, and Kansas to be among the states with such rules. We will focus here on California, because of the sparsity of documentation in the other states and because California's large Hispanophone population makes the situation there particularly glaring.

About 29% of California's population are Spanish speakers. [4] Guidelines provided by the California Office of Vital Records (OVR) inform county agents that baby names may contain only "the 26 alphabetical characters of the English language with appropriate punctuation if necessary" and that "no pictographs, ideograms, diacritical marks (including 'é,' 'ñ,' and 'ç') are allowed" [7].

The OVR's handbook cites Proposition 63, a 1986 ballot referendum which declared English the state's official language, as legal rationale for the agency's rule. Proposition 63 created Article III, Section 6 of the California Constitution, which not only cemented in writing the status of English, but also granted broad powers of enforcement to the state government:

> The Legislature shall enforce this section by appropriate legislation. The Legislature and officials of the State of California shall take all steps necessary to insure that the role of English as the common

> language of the State of California is preserved and enhanced. The Legislature shall make no law which diminishes or ignores the role of English as the common language of the State of California.
>
> (California Constitution, Article III, Sec. 6(c))

California's Department of Public Health interprets this language as mandating the prohibition of "non-English" characters in Californian names; other government agencies interpret the law differently. Two California state parks, Año Nuevo State Park and Montaña de Oro State Park, manage to contain the Spanish ñ in their official names, which is reflected on the parks' official webpages. [1] [8] Likewise, the City of San José, California includes the accented é in its official name, and its Style Guide includes instructions on how to produce it digitally: "To create an accented é, hold down the alt key and type '0233', on the numeric key pad." *City of San José style guide* [2] California's Department of Public Health likely disobeys the city's guidelines in birth certificates, though this needs to be verified.

A 2014 bill in the California State Assembly sponsored by AM Nancy Skinner (AB-2528) sought to rectify the state's processing of birth certificates and driver's licenses by allowing diacritical marks in names. The bill "required the State Registrar to ensure that diacritical marks on English letters are properly recorded on birth certificates, death certificates, certificates of fetal death, and marriage licenses, including, but not limited to, accents, tildes, graves, umlauts, and cedillas". [ab-2528]

AB-2528 stalled in the Appropriations Committee once state agencies assigned multi-million dollar price tags relating to IT upgrades, noting that the DMV's software could not "even accept lower-case letters". For this same reason the bill was opposed by the County Recorder's Association of California.

In 2017, California AM Jose Medina revived the issue with AB-82, which ultimately passed both houses of the legislature before being vetoed by Governor Jerry Brown. Unlike the 2014 bill, this edition did not affect the issuance of driver's licenses, only birth certificates. Passing through many more stages of the legislative process, the committee hearings gathered more detailed estimates for the cost of IT upgrades than they had in 2014:

- $230,000 for IT upgrades at Department of Public Health
- $2 million per year for Department of Public Health to correct existing records
- Loss of revenue of $450,000 per year to Department of Public Health since they would not be able to electronically transmit names to SSA (at $3 per name) containing diacritics
- Up to $12 million for local governments to upgrade their systems
- $1–3 million in upgrades to Department of Health Care Services
- Unknown administrative costs to Department of Social Services

The sticking point for Governor Brown was compatibility with federal databases, which do not accept diacritics. In his veto message, he argued that the risks to vital records outweighed the benefits of cultural openness:

"Mandating the use of diacritical marks on certain state and local vital records without a corresponding requirement for all state and federal government records is a difficult and expensive proposition. This bill would create inconsistencies in vital records and require significant state funds to replace or modify existing registration systems."

The committee findings make clear that the state would incur nontrivial costs to update the name registration systems. Little discussion is included of the possible creative solutions to the problem. Even assuming that government systems cannot be made to support the full UTF-8 standard, there are ways of representing information using ASCII. For example, we will see later that the international specification for machine-readable passports has a variety of control sequences for representing subtle distinctions in the Latin, Cyrillic, and Arabic alphabets using only the 26 plain characters of the English alphabet. The original form can be recovered nearly losslessly using the transliteration table.

In Massachusetts, the "characters have to be on the standard american keyboard. So dashes and apostrophes are fine, but not accent marks and the such" [7].

"All special characters other than an apostrophe or dash" are prohibited [7]. Technical limitations of the state's database systems prevent the inclusion of any diacritical marks.

Restrictions are similar to those in Massachusetts [7].

5 China

5.1 Ma Cheng

5.2 Zhao C

[how did it impact life]

A man who had gone by the name of Zhao C his whole life found that the Public Security Bureau would no longer grant him an ID card that includes a Latin character. Luckily Mr. Zhao's father was a lawyer, and brought suit. The father's evidence rested on the fact that Latin characters are already well-integrated in to Chinese life; for example, the name of CCTV, China's national broadcasting channel, and the Pinyin system, which is the PRC-endorsed transcription system for Mandarin. The case was resolved when Zhao agreed to voluntarily

change his name, presumably to avoid further administrative headache for the rest of his life.

6 Passports

The protocol governing machine-readable travel documents (MRTD) is Document 9309, issued by the International Civil Aviation Organization [5]. These standards define the common form that all passports must take to ensure interoperability. Since all states must operate on a shared standard, the diplomatic community has forged a compromise between cultural diversity and international security; the 9309 standard provides sufficient flexibility to accommodate the diverse languages and scripts used worldwide.

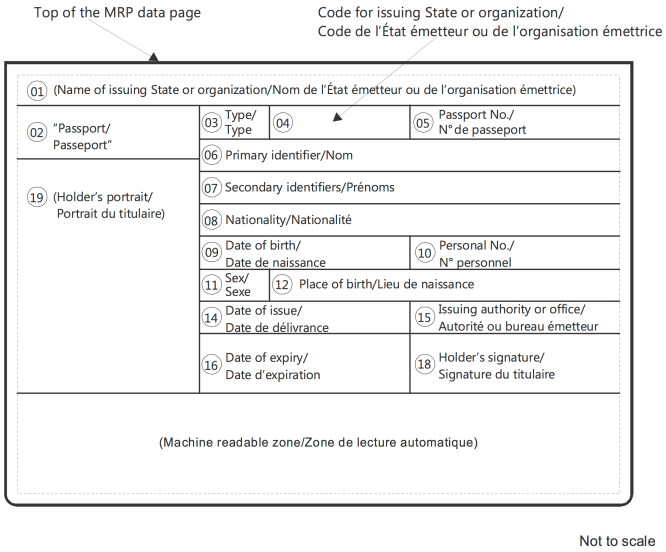
A 9309-compliant MRTD data page is divided into two sections: the Visual Inspection Zone (VIZ) and the Machine Readable Zone (MRZ).

6.1 Visual Inspection Zone

The Visual Inspection Zone, consisting of the top two-thirds of the passport's data page is designed for inspection by border officials at the point of entry. States may populate the required VIZ fields in their official language provided a translation is provided into English, Spanish, or French. Modernized passports do not *per se* coax a country toward the adoption of standard alphabets; however, they do ensure effcient intercommunication in the world's *scripta franca*, the Latin alphabet.

6.2 Machine Readable Zone

In contrast, the content of the Machine Readable Zone is highly controlled. The only characters allowed in the two lines of the MRZ are those belonging to a defined ASCII subset: (0-9, A-Z, and <). Moreover, these characters must be printed in the typeface OCR-B (OCR=Optical Character Recognition) using character and line spacings strictly defined in the 9309 standard. The adherence to these guidelines allows for unambiguous machine recognition.



In the Latin alphabet, most characters with diacritical marks simply have the mark dropped; some characters, however, do have special encodings to losslessly transliterate the character. The document provides a more extensive scheme for the Cyrilic and Arabic scripts, which allows nearly lossless recovery of the original form from the MRZ content. They even provide a sample Python program for converting from the MRZ name to Unicode Arabic ([5] (3.B.7.1).

6.2.1 Latin

The ICAO tries to account for the varying importance of diacritical marks in Latin-based scripts. Those such as the acute or grave accents, which appear over vowels mainly for the purpose of clarifying pronunciation, are simply eliminated in the MRZ. However, other characters receive recommended encoding methods These are the more "salient" diacritic characters, such as the German umlauts (ä, ö, ü) or the Spanish ñ, which in their respective languages are considered separate letters, rather than a variation on the unaccented form. The following table shows the special encodings recommended for European diacritics; all other characters simply have the mark dropped:

Unicode	Character	Description	Transliteration
00C4	Ä	A diaeresis	AE or A
00C5	Å	A ring above	AA or A
00C6	Æ	ligature AE	AE
00D1	Ñ	N tilde	N or NXX
00D6	Ö	O diaeresis	OE or O
00D8	Ø	O stroke	OE
00DC	Ü	U diaeresis	UE or UXX or U
00DE	Þ	Thorn (Iceland)	TH
00DF	ß	double S (Germany)	SS
0132	IJ	ligature IJ (Netherlands)	IJ
0152	Œ	ligature OE	OE

([5] 3.6.A)

The name “Térèsa Cañón” would become CANXXON«TERESA in the MRZ. The ñ is encoded in the MRZ, while no distinction is made of the é or è. Likewise, the German name “Wilhelm Furtwängler” would become FURTWAENGLER«WILHELM (ä becomes AE). (b.4.2) Although it leaves a large set of European characters unrepresented, it would not be difficult to expand the escape sequence system to represent additional diacritical marks. (An interesting edge case would be a Spanish traveller named José Nuñenxx.)

6.2.2 Cyrillic

The ICAO transcription system for Cyrillic characters permits a nearly one-to-one transliteration between the MRZ and the name in the original language. The system recognizes the different values that a Cyrillic glyph might take in various languages. For example the letter Ю is transliterated as “IU”, unless it is the first character of a Ukrainian name, in which case “YU” is permitted. Likewise for Щ; this is SHCH, except in Bulgarian, where it is SHT.

6.2.3 Arabic

For example, the Arabic name ابو بكر محمد بن زكريا الرازي would be rendered in the MRZ as ABW<BKR<MXHMD«BN<ZKRYA<ĀLṚAZY.

While the name looks incomprehensible to a human, the encoding permits a one-to-one mapping between the MRZ and the original Arabic name. See more examples in the figure below:

B.5.9 Further examples

Arabic: هاري الشماع
VIZ: **Hari Al-Schamma**
MRZ: `HARY<ALXSHMAE<<<<<<<<<<<<<<<<<<<<<<<<<<`

Arabic: سمير بادمكدوذيل
VIZ: **Samir Badmakduthal**
MRZ: `SMYR<BADMKDWXDHYL<<<<<<<<<<<<<<<<<<<<<<`

Arabic: جمال عبد الناصر
VIZ: **Gamal Abdel Nasser**
MRZ: `JMAL<EBD<ALNAXSSR<<<<<<<<<<<<<<<<<<<<<<<`

Arabic: العباس عبد الله بن محمد السفاح
VIZ: **al-'Abbās 'Abdu'llāh ibn Muhammad as-Saffāh**
MRZ: `ALEBAS<EBD<ALLXH<BN<MXHMD<ALSFAXH<<<<<<`

Arabic: عبدالله محمد بن عمر بن الحسين فخر الدين الرازي
VIZ: **Abdullah Muhammad ibn Umar ibn al-Husayn Fakhr al-Din al-Razi**
MRZ[7]: `EBD<ALLXH<MXHMD<BN<EMR<BN<ALXHSYN<FXKHR`

Arabic: عبدالعزيز بن متعب
VIZ: **Abdul Aziz bin Mithab**
MRZ: `EBD<ALEZYZ<BN<MTEB<<<<<<<<<<<<<<<<<<<<`

Arabic: إسماعيل عزّ الدين
VIZ: **Isma'il Izz-ud-din**
MRZ: `ISMAEYL<EZZ<ALDYN<<<<<<<<<<<<<<<<<<<<<<`

Arabic: جميلة نعيمة
VIZ: **Jamillah Na'ima**
MRZ: `JMYLXAH<NEYMXAH<<<<<<<<<<<<<<<<<<<<<<<<`

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[1] *Año Nuevo State Park*. California Department of Parks and Recreation. URL: `http://www.parks.ca.gov/?page_id=523`.

[2] *City of San José style guide*. City of San José, California.

[3] *Convention on the Rights of the Child*. New York: United Nations General Assembly, 1989.

[4] *Detailed Languages Spoken at Home and Ability to Speak English for the Population 5 Years and Over for States: 2009-2013*. United States Census Bureau. 2015. URL: `http://www2.census.gov/library/data/tables/2008/demo/language-use/2009-2013-acs-lang-tables-state.xls?#`.

[5] *Document 9309: Machine Readable Travel Documents*. International Civil Aviation Organization. Montréal, 2015.

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