

SAND WAFERS CHIPS AND BEYOND – THE INTEL EXPERIENCE

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Silicon a natural semiconductor and the most abundant material on earth after oxygen is the backbone of the microprocessor industry. Found plentifully on beach sand, it has to be melted, purified and cooled to form an ingot. The almost hundred percent pure (99.999) silicon ingot is then sliced into discs called wafers. Chips are then built on the wafer surface in a fabrication facility called “fab”. Making chip is a very complex process requiring maybe up to fifteen hundred independent operations. The engineering depending on the chip’s intended use. Chips look flat to the naked eye but in reality are three dimensional structures and may include dozens of layers of complex circuitry. Necessity is the mother of invention they say and the necessity for more efficient, powerful and less expensive chip is the driving force behind their technological development.

The Intel Museum located in Robert Noyce Building of the Intel Headquarters in Santa Clara, California has exhibits of Intel products and depicts its proud history. The museum started in 1980 and opened to public viewing twelve years later. Admission to the museum is free and open Monday through Saturday. Located in the hub of Silicon Valley the 10,000 sq ft museum offers a rare insight into the high tech industry of the world’s largest chip manufacturer. It contains iterative displays of how silicon chips are made, how they work and above all how they power our digital world. The self-guided tour of the museum was an experience that we shall never forget. With dozens of exhibits the museum also chronicles the life of its innovative genius Robert Noyce (1927-1990) – Intel’s co-founder and the co-inventor of the integrated circuit or microchip (along with Jack Kilby). The realization of microchip that powered the personal computer revolution is believed to be the reason behind Silicon Valley’s name and Robert Noyce is lovingly called the “Mayor of Silicon Valley”. The Intel timeline also sketches the life of another co-founder Gordon Moore (1929 -). Moore is credited with the observation that transistors the basic building block of microchips will

both decrease in size and cost at an exponential rate. For more than fifty years since 1965, his prediction has led to more efficient and powerful microchip that powered personal computer, tablets, smart phones, data collection, retrieving and transmitting centers etc. The observation now known as Moore’s Law says “The number of transistors incorporated in a chip will approximately double in every 24 months”.

The purest thing we will ever touch – a silicon ingot is also on display. Subsequently the silicon chip manufacturing processes are shown in the Intel Fab exhibit area over close circuit TV, where scientists and technicians in “bunny suits” in ultra clean environment work through the complex processes. We also simulated the Fab conditions in the museum by putting on bunny suits and walked around the perforated flooring through which purified air 100 times cleaner than a hospital operating theater circulates. Another interesting display allows us to “spell” our name in two digit binary language computer. Intel’s first microprocessor 4004 and the evolution to its present state where more than a billion transistors are stacked in a wafer the size of a finger nail are also on display. The most sophisticated processor containing billions of transistors are interconnected by fine copper wire that controls the flow of electricity through the chip to send, receive and process information. Time has thus to be measured in billionth of a second and distances to billionth of a meter.

The original IBM PC containing the Intel 8088 microprocessor is also on display.

Intel’s manufacturing and fabrication facilities “fabs”, in and around Hillsboro, Oregon spreads over four huge campuses. These campuses comprise Intel’s largest and most sophisticated sites in the world. The company has over 17,000 employs in Oregon making it the state’s largest private investor. With the addition of two new facilities MOD1 and MOD2 at the Ronler Acers Campus, Hillsboro, the company’s research and fabrication facilities are poised to break new grounds in semiconductor technology. It is a great feeling to find that at these facilities more than two hundred engineers from Bangladesh are actively engaged in research and manufacturing. Apart from Intel there are smaller industries in and around the area that has earned it the nickname “Silicon Jungle”.

In the last interview Noyce was asked by journalists what he would do if he were “Emperor of USA”. He replied he would among other things “make sure we are preparing our next generation to flourish in a high – tech age. And that means education of the lowest and poorest, as well as at the graduate school level”.

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EXPERIENCE

CITY



EXISTING CRISIS IN LOCAL BUSES

NILIMA JAHAN

PHOTO: PRABIR DAS

“I wish I had wings so that I could fly to my school!”- dreams Nuha Amin (not her real name), a student of class VI of Agrani High School and College. Little Nuha who takes a local bus to reach her school can not reach the ceiling to hold on the handles, yet she manages a place to stand in the crowd with a heavy school bag on her back. While getting down, she always tries to stand close to the gate of the bus, but the passengers often push her in the middle making it difficult for her to get down.

Nuha’s experience is one of the most common scenarios that the local bus commuters face on a regular basis in Dhaka today. Now-a-days, according to the regular passengers, the local bus services have failed to meet their travel needs because of the existing poor quality services which mostly create trouble for the children, women and disabled persons.

As buses are the cheapest medium of transport in Bangladesh and Dhaka being the most densely populated city, problems in public transport is inevitable. As there is no alternative to buses, people must have to use local buses, as private buses are not sufficient in proportion to the number of passengers.

At present, poor service and worst environment are making the passengers who use local bus services in Dhaka city regularly very uncomfortable. They have to face a number of problems like- long



waiting period, traffic jam, increased amount of fare, over-crowd, unavailability of seats, rude behaviour of the bus staff members, delayed boarding time, discomfort inside the bus, transport inadequacy during peak hour and many more.

“I find very little legspace, as in most of the local buses, the space between seats is not enough to sit comfortably especially for people who are a bit taller,” says

Habibur Rahman, a regular passenger of local buses who travels from Farmgate to Airport everyday for work. Besides all these factors, standing and hanging on the door, unexpected breakdown for fitness problems, unavailability of information of bus services, lack of facilities in stoppage areas add more trouble to the passengers of local buses create a bitter experience.

While asking about the facilities that

passengers demand, they have mentioned a couple of things like-improved interior environment, government approved rational fare chart, well -mannered bus staff members and picking up passengers from specific stops, so that they could travel with more convenience. “The tendency of picking up passengers from unspecified stops must be stopped immediately,” claims Hasina Begum, another regular passenger of city buses. Disciplined behaviour of passengers is also a great solution as they don’t think others’ problems while boarding and alighting desperately.

The authorities are also taking this issue quite seriously. “According to the rules in Motor Vehicles Ordinance and Motor Vehicles Rules, the seat capacity is limited in a bus and the bus staff cannot board extra passengers,” says Md Nurul Islam, Deputy Director (Eng) of Bangladesh Road Transport Authority (BRTA). “Without following the rules and regulation if they keep taking passengers illegally for extra money, it’s their fault and our law enforcement department strongly deals with these problems,” adds Islam.

However, the combined efforts of the authorities, Bangladesh Sarak Paribahan Malik Samity and the passengers can make the local bus services a pleasant mode of travel so that everybody can travel by the local buses without any fear and hesitation. ■

NUMBERS | 769 and counting

It is the disastrous number that announces the deadliest Hajj episode in the recent time. On Thursday, more than 769 people were killed in a stampede outside the holy city of Mecca during the annual Hajj pilgrimage, when two large groups of pilgrims arrived together at a crossroad. At least 18 Bangladeshis were killed in this crowd crush while many other got severely injured and another great number of people still remain missing since the stampede. This is not the first terrible accident that occurred during the Hajj this year, more than 100 people died when a construction crane collapsed near Mecca’s Grand Mosque.

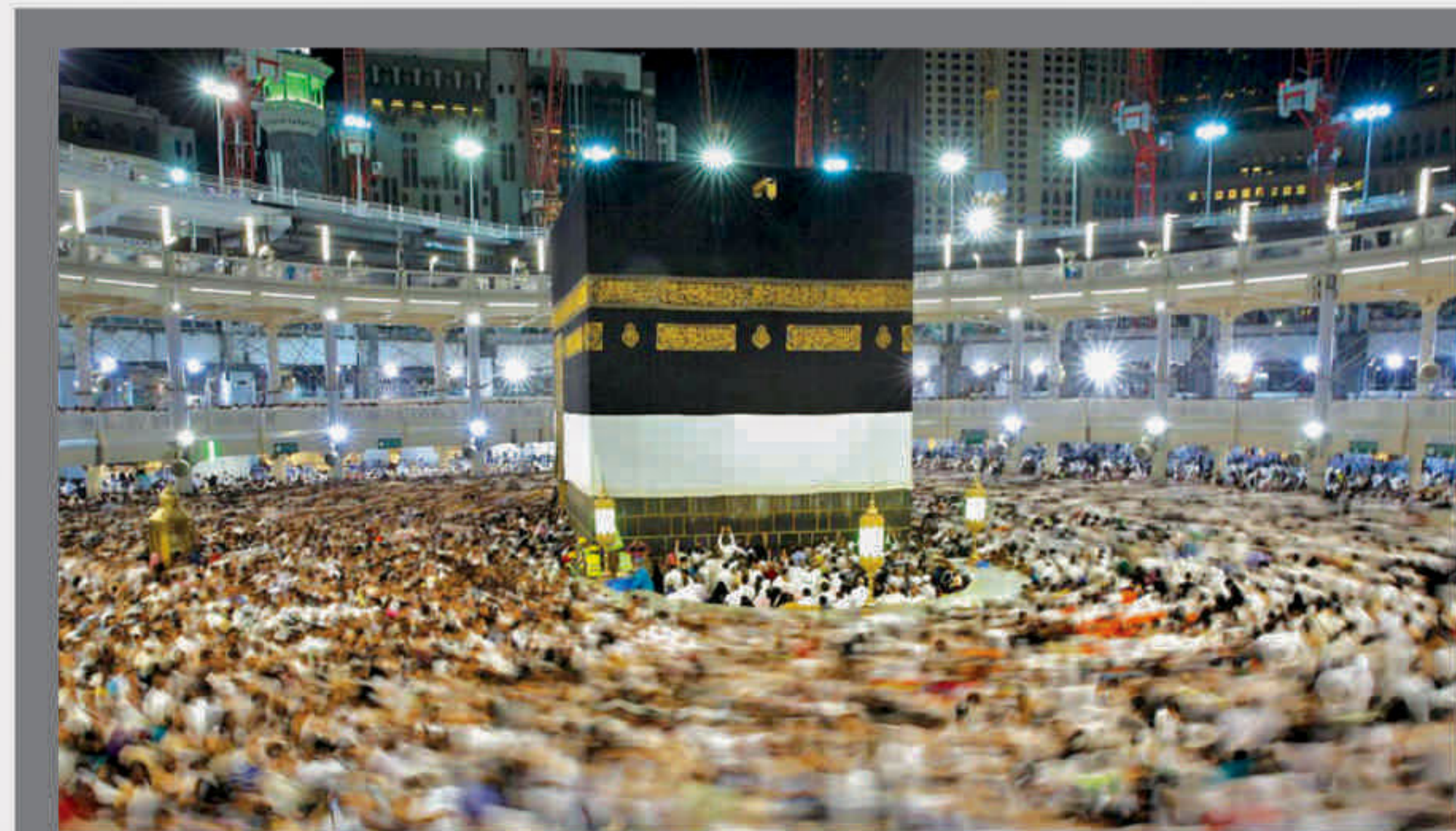


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