Introduction to MIS

Emerging Trends

Learning Objectives

- Summarize new trends in software and service distribution
- Describe virtual reality components and applications
- Discuss uses of radio frequency identification
- Explain quick response codes
- Summarize new uses of biometrics
- Describe new trends in networking, including grid, utility, and cloud computing
- Discuss uses of nanotechnology
- Describe blockchain technology and cryptocurrency
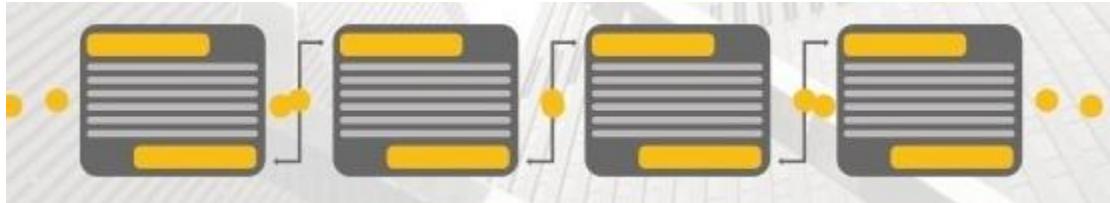
- Today "we are living in exponential times" – change keeps happening faster and faster
- One day we are buying our movie DVD's at Blockbuster, and it seems like the next day all the Blockbusters are gone and we're all downloading from Netflix
- One day we're going to Borders for our books, and suddenly the Borders are gone and we're buying books on Amazon and the like

3

It's great to be in IT…

- Software industry workers, are making more than twice the average annual wage of other workers, according to a 2019 research report by Software.org: The BSA Foundation

- The average annual wage for software jobs in the US was $114,000 in 2019, more than double the $51,960 annual wage for all US workers in 2018

- All told, the software industry directly employs 3.1 million people in the US — up 7.3 percent from 2016 — and indirectly supports a total of 14.1 million jobs

It's great to be in IT…

- The software industry invested more than $82 billion in research and development in 2018, accounting for more than 22 percent of US domestic R&D
- The software industry has expanded by 19 percent since 2016
- The number of software industry jobs grew twice as fast as overall US job growth
- In 2018, the software industry experienced double-digit growth in 39 states
  - Four states—Nevada, Washington, South Dakota, and Wyoming—saw growth of more than 30 percent
- Software supports one in every 10 jobs in the US

Major Impact New Technologies

- Data Analytics
- Internet Of Things (IofT)
- 5G Wireless Technology
- Identification – Beyond RFID
- Virtual Reality (metaverse)
- Cloud And Grid Computing
- CRISPR (Gene Manipulation) & "DNA Programming"
- Nanotech & New Materials (Graphene, Etc.)
- Blockchain
- Quantum Computing
- Artificial Intelligence & Robotics
- Space Exploration

Gene Silencing with CRISPR

Guide RNA   Cas9 Enzyme

Genomic DNA   Cut Genomic DNA   Non-Homologous   Inactivated Gene
                                              End Joining

Double Stranded
Break   Insertion/Deletion Mutation

After the Cas9 enzyme is guided to the right location in the genome and cuts the DNA, the cell's natural repair mechanisms take over. The cut is fixed by non-homologous end joining. This process is error-prone and does not perfectly replace the cut DNA, often resulting in an insertion or deletion mutation which silences the gene.

Gene Insertion with CRISPR

Guide RNA   Cas9 Enzyme

Genomic DNA   Cut Genomic DNA   Homology   New Functional DNA
                                             Directed
                                             Repair

Double Stranded   New DNA   Newly Inserted DNA
Break   (Delivered with CRISPR Plasmid)

To insert a gene, the new gene is added into the original CRISPR plasmid. It is designed to line up perfectly with the cut DNA strands, so the cell uses a different technique, homology directed repair, to incorporate a new stretch of DNA into the genome.

Radio Frequency Identification

- **Radio frequency identification (RFID) tag**
  - Small electronic device consisting of a small chip and an antenna provides a unique identification for the card or the object carrying the tag
    - Passive type: includes no internal power supply and can be very small
    - Active: includes an internal power source and is more reliable than a passive tag
- Replacing printed bar codes
- Example: shopping cart full of goods

RFID Tag

Chip

Antenna
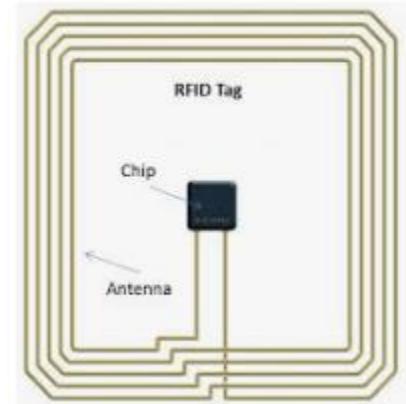
Printed Memory

- Xerox recently announced new printed packaging labels that can store 36 bits on rewritable memory

- The labels are aimed at combating counterfeiting and helping businesses and government better secure products as they are distributed

- The printed electronic labels, which Xerox is also calling "printed memory," can collect and store information about the authenticity and condition of products, storing up to 68 billion combinations

- The updatable labels, for example, can be used to determine if a product is genuine and to track how it's been handled during distribution

Printed Memory (con't)

- This makes it possible to ensure the integrity of a product from the time it leaves the factory to the time it gets into the hands of a customer

- Other uses for the rewritable data within each tag could be to identify if a medication refill has been authorized, if a shipping tax has been paid or if a package has passed through an authorized distributor

- The memory labels can be scanned using a simple smartphone-based reader, and the key label verification features will work offline, allowing secure validation of an object or process without being bound to the Internet

Printed Memory (con't)
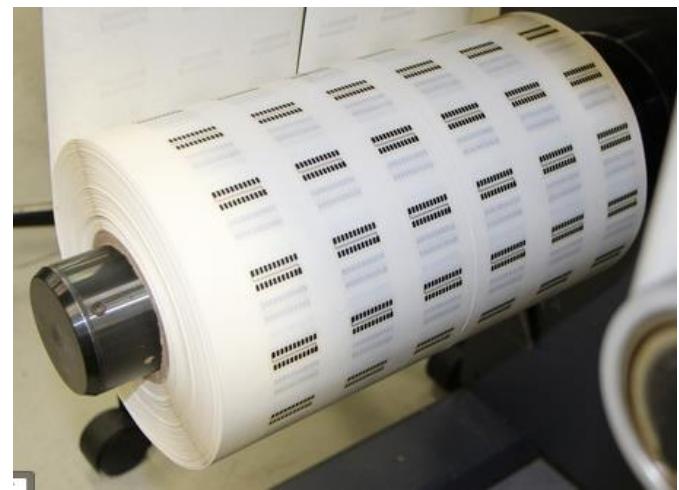
Quick Response Codes (QR)

- Matrix barcode consisting of black modules arranged in a square pattern on a white background
  - High storage capacity, small printout size, and dirt and dust resistant
  - Readable from any direction
  - Compatible with the Japanese character set
  - Can be read by smartphones equipped with cameras

Quick Response (QR) Codes

- The information encoded can be text, URL or other data

- QR codes storing URL's may appear in magazines, on signs, buses, business cards, or almost any object about which users might need information – <u>they bridge the gap between the offline world and the online world</u>

- <u>Users with a camera phone equipped with the correct reader application can scan the image of the QR code</u>

QR (con't)
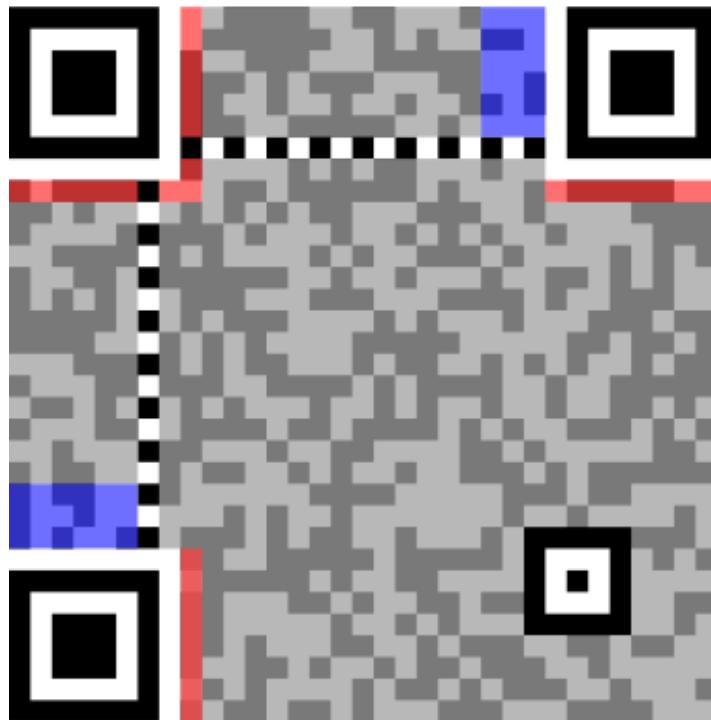
1. Version Information
2. Format Information
3. Data and Error Correction Keys
4. Required Patterns:

    4.1. Position

    4.2. Alignment

    4.3. Timing

QR App for SmartPhones

- http://www.i-nigma.mobi/

Welcome to i-nigma

In order to install i-nigma, you need to use your **mobile phone browser** and browse to www.i-nigma.mobi directly. Then please follow the installation steps. Installation process uses information retrieved from the phone browser in order to determine phone capabilities and to install the correct software version. If this still not work please notify us at **install@i-nigma.com** we may be able to help you

QR Generator
[http://qrcode.kaywa.com/]

QR Codes Can Be Dynamic Links

- Service providers allow QR code owners to dynamically link to different information <u>as a function of time or place of click</u>

- Used by salespeople on business cards to link not only to the company but to the latest sales presentation

- Also used now by music bands:
    - Clicking before a venue will point to upcoming schedule and tickets
    - Clicking at the current venue will show time and stage for the bands performance and other same day acts
    - Clicking after the venue will point to merchandise purchases

"Internet of Things"

- At any point in time in the near future, <u>billions of devices will be communicating with one another</u>: sensors in vehicles, roadways, power grids, irrigation systems, household appliances, and even our clothes

- Much of the intra-device communications will not be monitored by humans

FLEET TELEMATICS
Commercial vehicles can automatically transmit data about travel times and road conditions to a central computer, which in turn pushes the info out to other trucks in the fleet, allowing them to adjust routes and save time, gas, and money.

HEALTH
Patients can wear monitors embedded with cellular modules that transmit vital signs like heart rate or blood pressure. If an abnormality is detected, then doctors or family members will be alerted to check on the patient.

METER READING
Parking meters outfitted with special sensors can alert a police officer's mobile phone when a parked car's time has expired, allowing the cop to find the car and write a ticket.

CONSUMER TELEMATICS
Many cars are now embedded with mobile technology (GM's OnStar) that can in an emergency relay details such as the vehicle's location or problems with the electrical system.

Smart Tires

Italian tiremaker Pirelli has designed a "Cyber Tire" that can send messages to your car's engine, and even to other drivers, said Loz Blain in *NewAtlas.com*. "The world's first 5G-connected tire" has a "sensor, processor, and communications disc about the size of a medium coin embedded inside that's designed to constantly monitor a bunch of variables." Those include, naturally, tire pressure, but also "tread depth, tire temperature, acceleration," and the "ability to sense water and ice on the road." All that information is fed into the engine control so the car can automatically determine how to adapt traction control settings, suspension, or emergency braking. The Cyber Tires can also ping roadside 5G towers to send messages to nearby cars about hazardous road conditions.

IofT (con't)

- The new "Matter" protocol has been developed for standardization of device inter-communication

- The new Home Connectivity Alliance is creating standards and protocols for home device communication

Nanotechnology

- Incorporates techniques involving structure and composition of materials on a nanoscale
  - Plays a role in several key areas
    - Energy
    - Information and communication
    - Medical
    - Materials
  - Consumer goods incorporating nanotechnology (nanomaterials) are available in the market now

Nanotechnology (con't)

■ Nanotechnology as defined by size is naturally very broad, including many fields of science as diverse as surface science, organic chemistry, molecular biology, semiconductor physics, energy storage, microfabrication, molecular engineering, etc.

■ The applications are equally diverse in new fields of nanomedicine, nanoelectronics, biomaterials - ranging from extensions of conventional device physics to completely new approaches based upon molecular self-assembly, from developing new materials with dimensions on the nanoscale to direct control of matter on the atomic scale

Nanotechnology (con't)

Nanomaterials
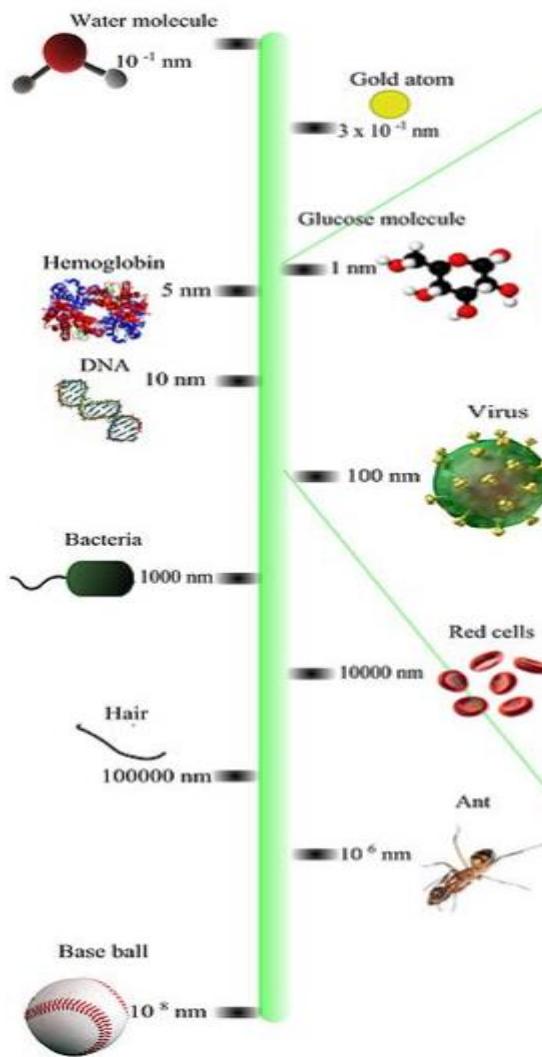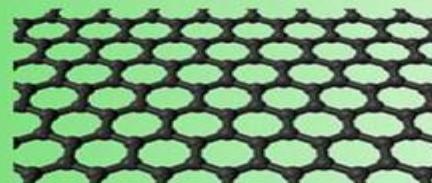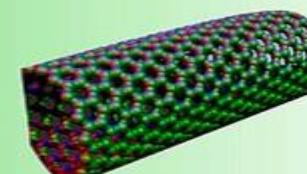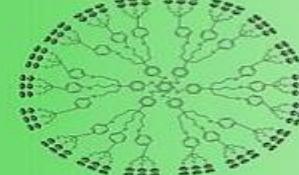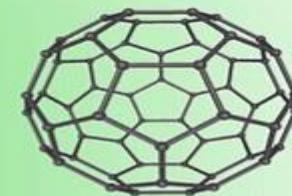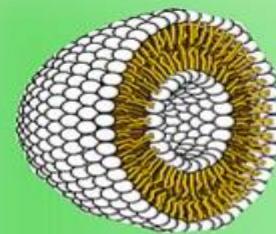
Graphene

- Graphene is an allotrope of carbon in the form of a two-dimensional, atomic-scale, hexagonal lattice in which one atom forms each vertex

- Graphene has many properties
  - It is about 100 times stronger than the strongest steel
 - It conducts heat and electricity very efficiently and is nearly transparent
  - Graphene also shows a large and nonlinear diamagnetism, even greater than graphite
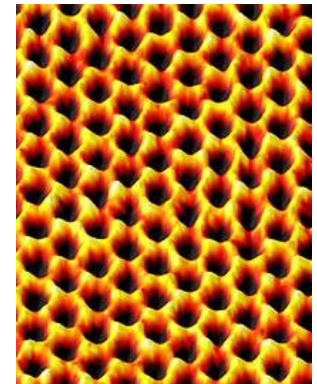
Graphene (con't)

- Graphene is a strong, transparent and flexible conductor that holds great promise for various material/device applications:
  - Replacement for aluminum, steel, and other building materials
  - Windshields for vehicles and space craft
  - Solar cells
  - Light-emitting diodes (LED)
  - Touch panels (smartphones, etc.)
  - Smart windows
  - Wearable devices

Exterior Glass

Interior Glass

RavenWindow
Thermochromic Filter

Low-E Coating

Air Gap

When it's hot outside, unwanted solar-heat transfer is blocked

When it's cold outside, solar heat is allowed inside the building
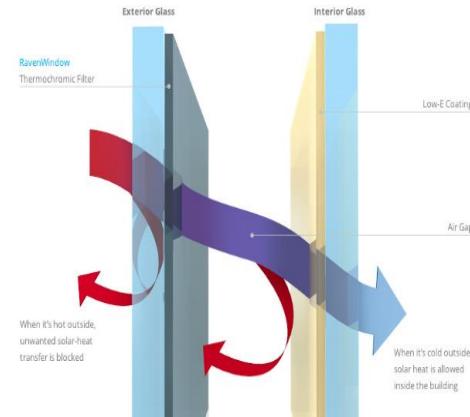
Wireless Communications

- **Today**
  - Wireless Fidelity (Wi-Fi)
  - Cellular 3G
  - Cellular 4G
    - Wi-max
    - LTE
- **Tomorrow**
  - 5G
  - Twisted Light
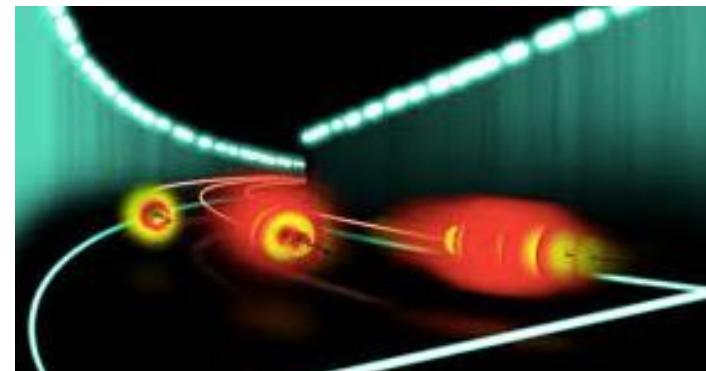
5G

- **5G** (**5th generation mobile networks)** denotes the proposed next major phase of mobile telecommunications standards
- The Next Generation Mobile Networks Alliance defines the following requirements for 5G networks:
  - Data rates of tens of megabits per second for tens of thousands of users
  - 1 gigabit per second simultaneously to many workers on the same office floor
  - Several hundreds of thousands of simultaneous connections for massive wireless sensor network
  - Spectral efficiency significantly enhanced compared to 4G
  - Latency reduced significantly compared to LTE
- The Next Generation Mobile Networks Alliance feels that 5G should be rolled out by 2020 - 2022

Mobile-phone generations

Theoretical:
latency, ms

speed, Gbps
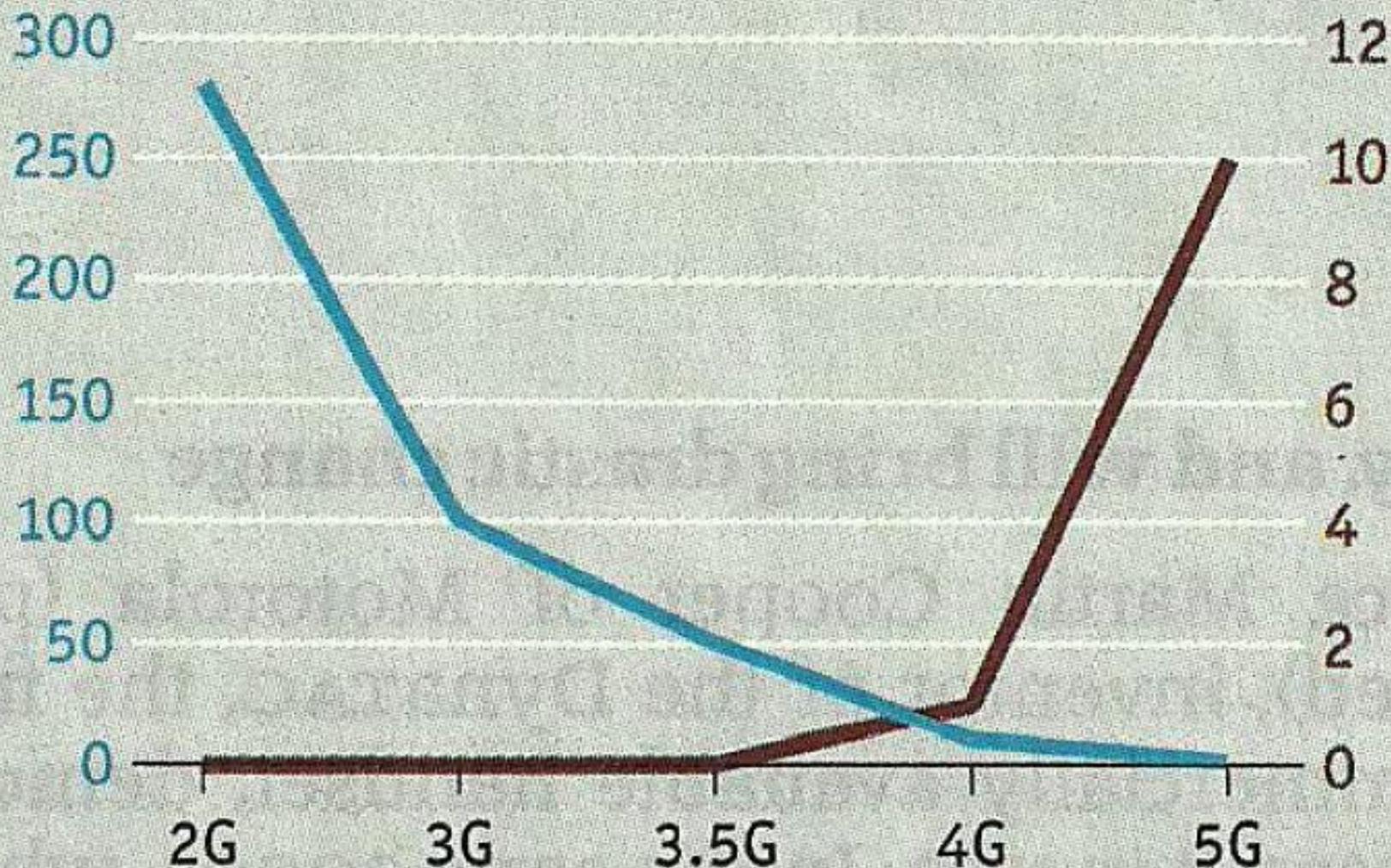
Twisted Light
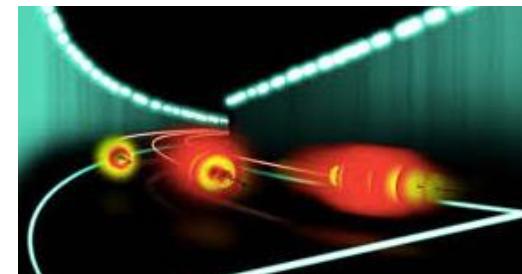
- As fast as fiber optic lines have become, they're still hamstrung by one key limitation: you still need to transmit that data over wires, which limits where you can transmit and the affordability of the fastest connections
- Scientists may have a way to eliminate those cables while offering even faster speeds
- They've discovered a way to 'twist' photons in a way that not only crams more data into each transmission, but survives interference from turbulent air
  - If you pass light through a special hologram, you can give photons an optical angular momentum that lets them carry more than just 1s and 0s
- There's still a lot of work to be done before this kind of wireless networking is practical
  - How do you serve a large number of people
  - How is data affected by rain or snow
  - The technology is clearly limited by the challenges of transmitting light (you couldn't use this to transmit indoors)
- It could be instrumental to the next generation of last-mile wireless networks; instead of having to painstakingly wire homes and offices to achieve multi-gigabit speeds, internet providers could use light-based wireless links for large parts of their network

Virtual Reality

- Uses computer-generated, three-dimensional images to create the illusion of interaction in a real-world environment
  - Simulation: giving objects in a VR environment texture and shading for a 3D appearance
  - Interaction: enabling users to act on objects in a VR environment
  - Immersion: giving users the feeling of being part of an environment
  - Telepresence: giving users the sense that they are in another location

Types of Virtual Environments

- Exocentric environment
  - User is given a "window view"
  - Data is rendered in 3D, but users can only view it on screen
  - Users cannot interact with objects
- Egocentric environment
  - User is totally immersed in the VR world
  - Technologies used with the environment
    - Head-mounted display (HMD)
    - Virtual retinal display (VRD)

Virtual Reality Applications

- Many applications
  - Improved surgeries
  - Games
  - Theaters
  - Business applications
    - Assistance for the disabled, architectural design, education, and flight simulation
  - Videoconferencing and group support systems
  - VR-based therapy

Virtual Worlds

- Simulated environment designed for users to interact via avatars
  - 2D or 3D graphical representation of a person in the virtual world
    - Used for gaming, in chat rooms, entertainment, and to conduct a variety of business activities
- Widely used virtual worlds
  - ActiveWorlds, Club Penguin, EGO, Entropia Universe, Habbo, RuneScape, Second Life

Augmented Reality

- Augmented reality (AR): branch of virtual reality that generates a virtual scene that is overlaid on the real object
  - Goal: enhance the user's perception of the real-world objects that the user is seeing or interacting with
- Difference between augmented reality (AR) and virtual reality
  - Augmented reality: users stay in the real-world environment while interacting with objects
    - Aware that they are still in the real world
  - Virtual reality: users are immersed in the virtual world
    - Mind is tricked into thinking they are in a virtual world

AR for Sizing & Try-On
[seekxr.com]

"Metaverse"

- Merging of the physical world with VR and AR

Computing Eras

- Mainframe (1960 – 1985)
- Mini-Computer & LAN (1980 – 1990)
- Client Server (1985 – 2000)
- Internet (1995 – 2005)
- Web2 - Social Apps (2005 – 2015)
- Cloud – Mobility (2012 - ????)

The Evolution of Computing

A look at how the industry has morphed during the last 50 years.

The World Wide Web debuts in 1993, with hyperlinks between mostly static web pages.

Personal computers for home and office go mainstream. Local area networks, or LANs, are used to link PCs in close proximity to one another.

The emergence of Web 2.0 allows users to interact and collaborate through social networking sites, blogs, wikis, and video sharing.

| 1960s | 1970s | 1980s | 1990s | 2000s | 2010s |

"Big iron" mainframe computers are used by large organizations for bulk data processing chores.
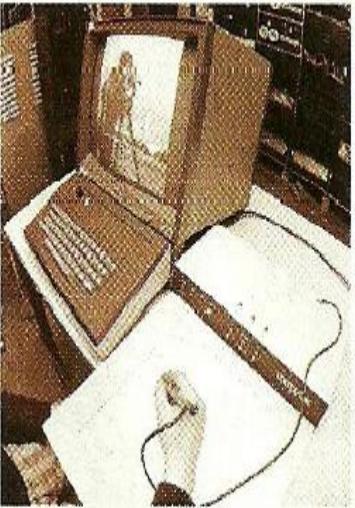
Minicomputers are developed, based on integrated circuit and core memory technologies.

Cloud computing—the era of on-demand computing, delivered via global networks—emerges.

S2

Cloud Computing Players

- Amazon EC2
- Amazon S3 (storage only)
- Microsoft Windows Azure
- Google AppEngine
- IBM Blue Cloud
- Apple iCloud
- Rackspace
- ThePlanet
- Joyent
- Nirvanix
- GoDrid

Cloud Computing
everything and the kitchen sink
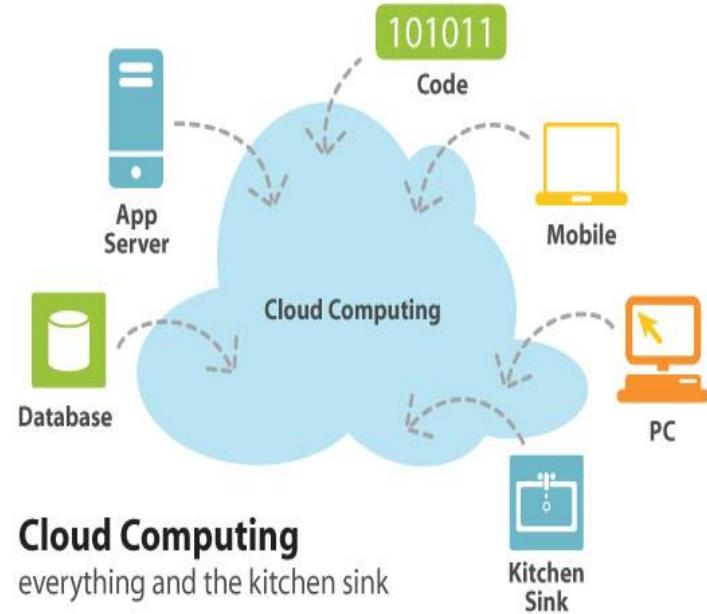
On-Premise vs Cloud
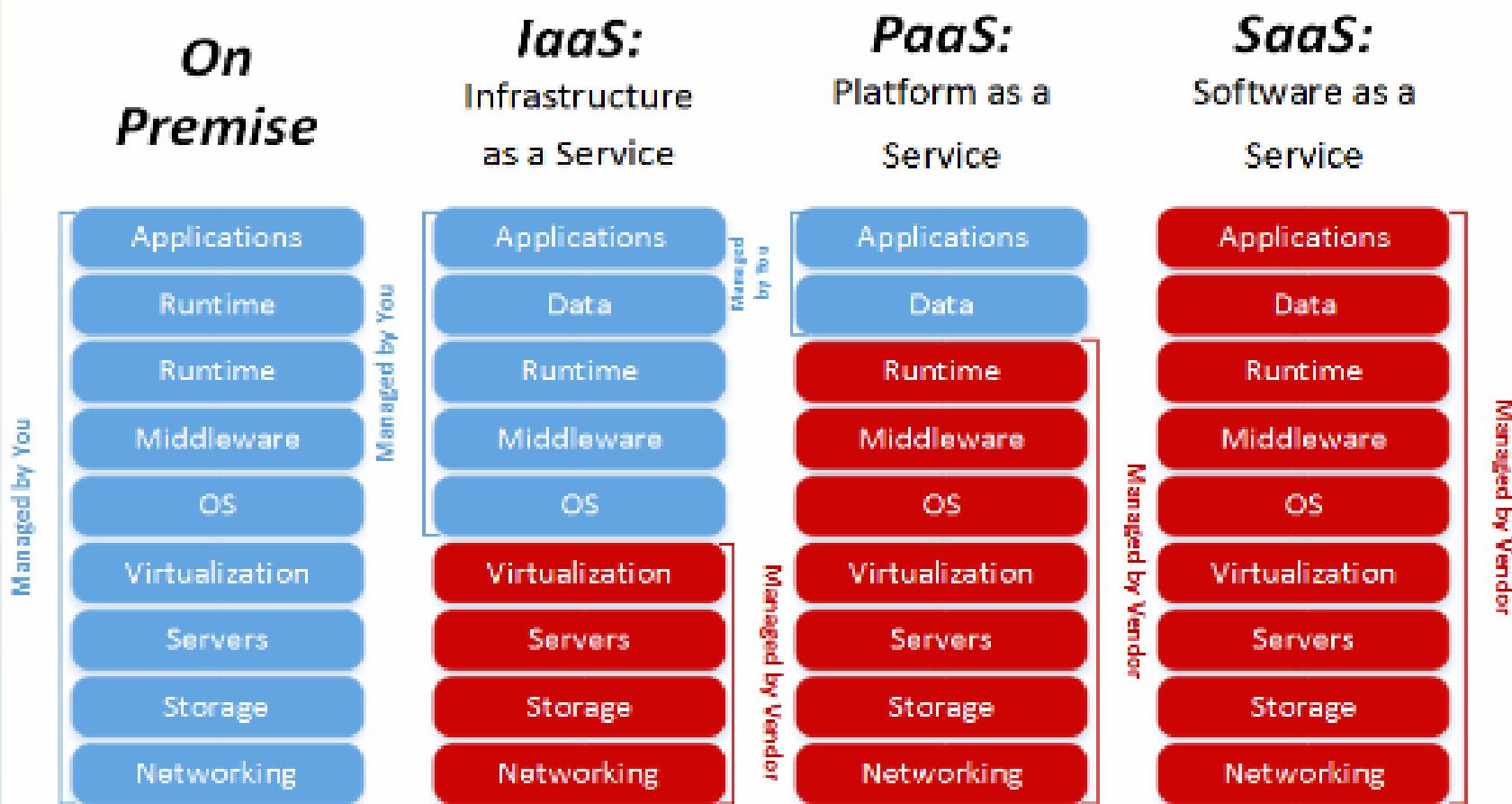
Cloud Revenue

Vendor	2018 Cloud Revenue
1. Microsoft	$32.2B
2. AWS	$25.7B
3. IBM	$19.2B
4. Salesforce	$13.0B
5. Accenture	$9.0B
6. SAP	$5.6B
7. Oracle	$5.3B (est.)
8. Google Cloud	$3.4B (est.)
9. Workday	$2.8B
10. ServiceNow	$2.6B

Amazon EC2

Rackspace

Rackspace Pricing

How We Price Cloud Servers™

You pay for each Cloud Server (virtual instance) by the hour. For your convenience, the monthly totals are also listed.

Server Sizes:	Linux®*** Hourly (Estimated Monthly)	Windows® Hourly (Estimated Monthly)
256MB RAM **10**GB Disk	$0.015/hr. ($10.95/mo.)*	—
512MB RAM **20**GB Disk	$0.03/hr. ($21.90/mo.)*	—
1,024MB RAM **40**GB Disk	$0.06/hr. ($43.80/mo.)*	$0.08/hr. ($58.40/mo.)*
2,048MB RAM **80**GB Disk	$0.12/hr. ($87.60/mo.)*	$0.16/hr. ($116.80/mo.)*
4,096MB RAM **160**GB Disk	$0.24/hr. ($175.20/mo.)*	$0.32/hr. ($233.60/mo.)*
8,192MB RAM **320**GB Disk	$0.48/hr. ($350.40/mo.)*	$0.58/hr. ($423.40/mo.)*
15,872MB RAM **620**GB Disk	$0.96/hr. ($700.80/mo.)*	$1.08/hr. ($788.40/mo.)*
30,720MB RAM **1200**GB Disk	$1.80/hr. ($1,314/mo.)*	$2.16/hr. ($1,576.80/mo.)*
Add Managed Service Level	+ $0.12/hr. per server (+ $100/mo.)** Learn More About **Managed Service Level**	
Add SQL Server 2008 R2	Not Available	+$0.72/hr. per instance (Standard Edition) +$0.06/hr. per instance (Web Edition)

Calculate Your Server Costs

Use this handy calculator to run some rough numbers of what it might cost to use Cloud Servers™ for your project.

Operating System

◉ Linux   ○ Windows (Minimum size of 1024MB for Windows)

☐ **Add Managed Service Level** (What is this?)
(Adds $0.12 per hour per server plus a flat $100/month account fee)

Server Size (Memory in Megabytes)

256 512 1024 2048 4096 8192 15872 30720

Number of Servers:	1
Monthly Hours of Service: (average time per server)	730 hr
Number of Red Hat Servers:	0
Outgoing Bandwidth:	0 GB
Estimated Monthly Total:	$10.95

Clear Form

ALL BACKED BY FANATICAL SUPPORT.

READY? SIGNUP NOW

Grid Computing

■ Grid computing

- Involves combining the processing powers of multiple computers

- Allows users to make use of other computers' resources to solve problems involving large-scale, complex calculations

- Each participant in a grid is called a "node"

  - Processing on overused nodes can be switched to idle servers or desktop systems

Grid Computing (con't)

- Used in bioinformatics, oil and gas drilling, and financial applications including cryptocurrencies
- Advantages
  - Improved reliability
  - Parallel processing
  - Scalability
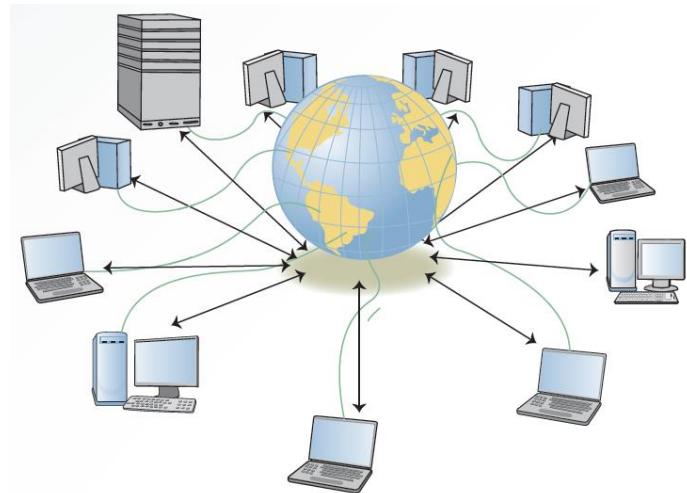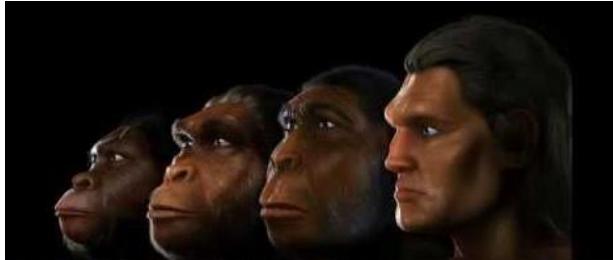
- Historians believe that early modern man (homo sapiens) persevered over competing humanoid forms via their ability to <u>unite in large numbers</u> due to shared beliefs in something powerful and intangible as well as mediums of exchange for goods and services

- Early man used a "time standard" exchange; if it takes me 8 hours to build an igloo and it takes you an hour to catch a fish, then I'll build you an igloo if you promise me 8 fish - people used "in-head tabs"

- The use of some physical medium of exchange instead of barters dates back to early man (animals, tusks, grains, hides, shells, beads, etc.)

- "Currency" in the form of silver bars for exchange dates back 3000 BC in Mesopotamia

- The earliest knowns use of precious metal coins was the Lydians (now in Turkey) in about 600 BC

- Later paper certificates that could be redeemed for the metal which were used in China in about 500 BC

47

Today's Fiat Money

- In 1792 the US the Mint Act was passed in which the dollar was defined as 371.25 grains (24.056 g) of silver, and various gold conversions were defined

- The Gold Standard Act of 1900 abandoned the bimetallic standard and set the dollar as 23.22 grains of gold

- However, since 1971 U.S. paper currency is not backed by any precious metal, thus the U.S. dollar is now fiat money

  - Fiat money is currency that a government has declared to be legal tender, but it is not backed by any physical commodity

  - The value of fiat money is derived from the relationship between supply and demand and based solely on the faith and credit of the government economy

48

Silver Certificate

Cryptocurrency

- Now "we are at the dawn of a new revolution" which started with the digital bitcoin currency ("cryptocurrency")

- Bitcoin allows the instant certified transfer of money electronically between possibly unrelated and distant parties without the need for an intermediary trusted authority (i.e. bank)

- The US, Canada, Japan, Russia, Singapore and other governments are actively working on cryptocurrencies

Getting Some Bitcoin
(via Coinbase, etc.)
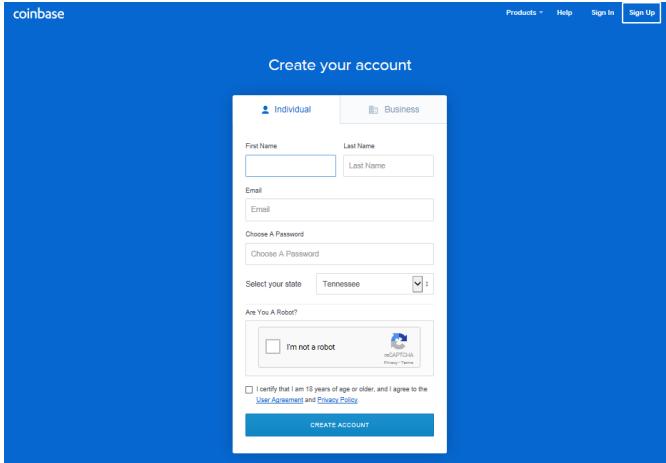
Satoshi Nakamoto is thought to have started bitcoin, but we still don't know who Nakamoto really is.

Anyone own any bitcoins ?

Can also invest thru an ETF such as Reality Shares Nasdaq Nextgen Economy

51

Bitcoin Price & Volume

Copyright Dan Brandon, PhD, PMP
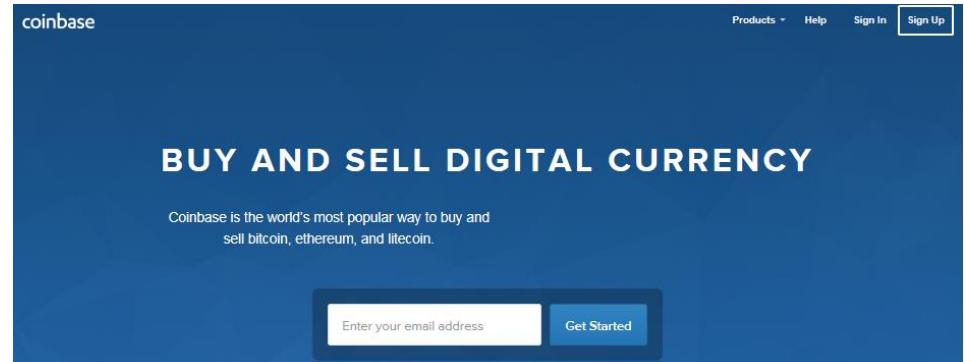
Blockchain

- However, at this point in time, cryptocurrencies are still mainly speculative assets (also often used to hide money flows)
- But it is really the **technology behind bitcoin**, something called the **"blockchain"**, which is the driving force this new revolution

Replacing Tradition Business Information Systems ?

- What blockchain did for currency, it may do to an even greater extent for many other areas of business and their supporting information systems

- It may replace portions of tradition business information systems

How a blockchain works

① A wants to send money to B

② The transaction is represented online as a 'block'

③ The block is broadcast to every party in the network
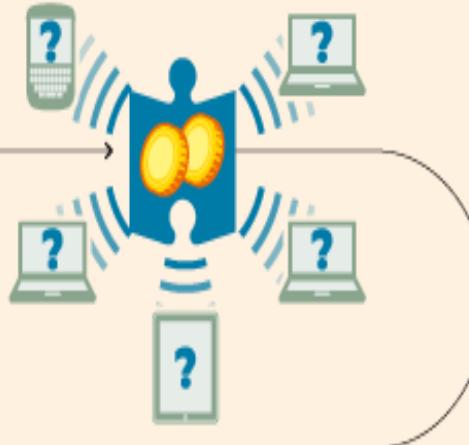
④ Those in the network approve the transaction is valid
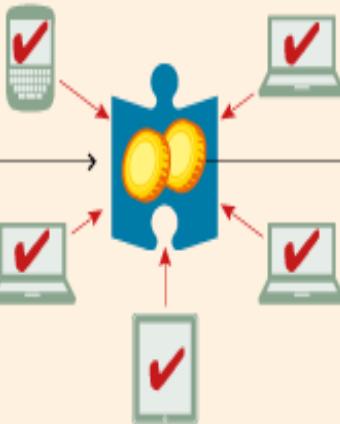
⑤ The block then can be added to the chain, which provides an indelible and transparent record of transactions

⑥ The money moves from A to B

Old Library Book Card Analogy
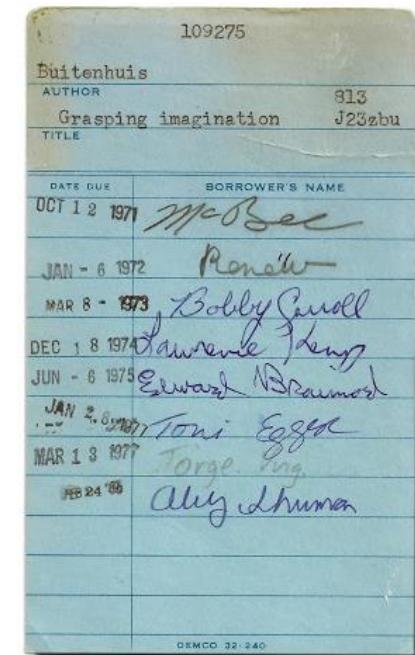
DUE DATE	TRANSACTIONS
	4AC37DFZ paid 7ACH9PJ 42 BTC

55
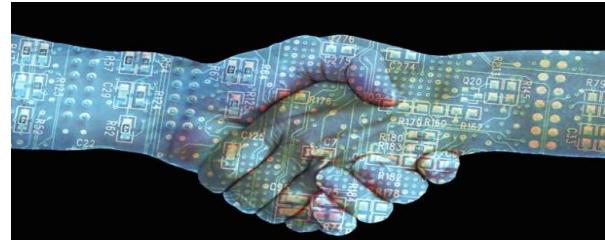
Shared Chain

A blockchain is a database shared by every participant in a given system. The blockchain stores the complete transaction history of a cryptocurrency or other record keeping system.

new transaction

transaction gate
(A process that ensure only valid entries are added)

blockchain

block 102 → transactions

block 103 → transactions

block 103 → transactions
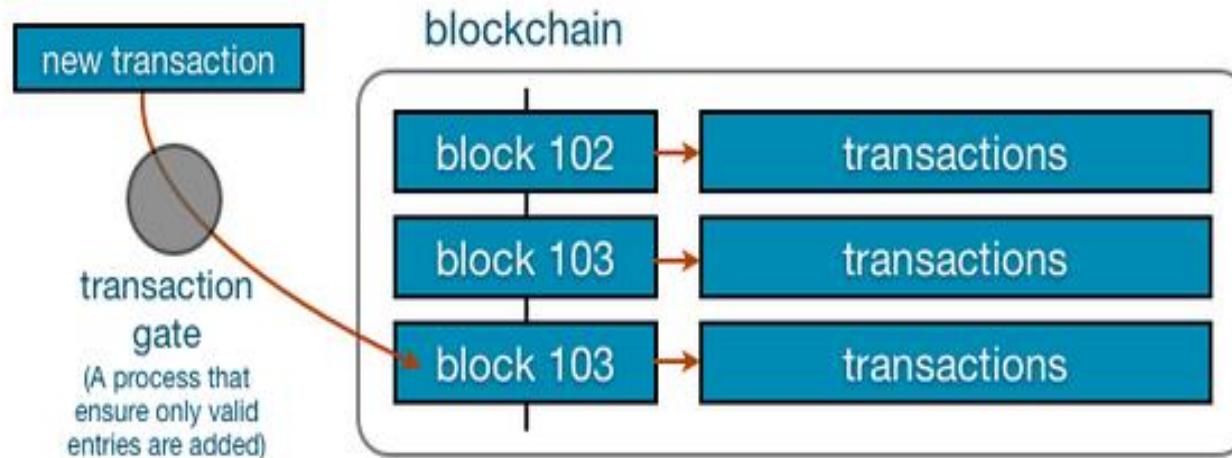
Transactions aren't recognized until they are added to the blockchain. Tampering is immediately evident, and the blockchain is safe as record because everyone has a copy. The source of discrepancies is also immediately obvious.

Chain Integrity

- **The blockchain is replicated across a number of nodes (servers)** who share the entire chain

- Every block contains a <u>hash of the previous block</u>, **thus imprinting the entire chain's "DNA" into each block**

- Each block is guaranteed to come after the previous block chronologically and integrity is preserved once the block has been added to the chain

- **A "balance" for some account of some party can always be calculated by scanning the chain** as there is only one path from any block back to the genesis block

Why You Can't Cheat at Bitcoin

1. Say everybody is working on **block 91**.

2. But one miner wants to alter a transaction in **block 74**.

3. He'd have to make his changes and redo all the computations for blocks 74−90 and do block 91. That's **18 blocks of expensive computing**.

4. What's worse, he'd have to do it all **before** everybody else in the Bitcoin network finished **just the one block (number 91)** that they're working on.

57
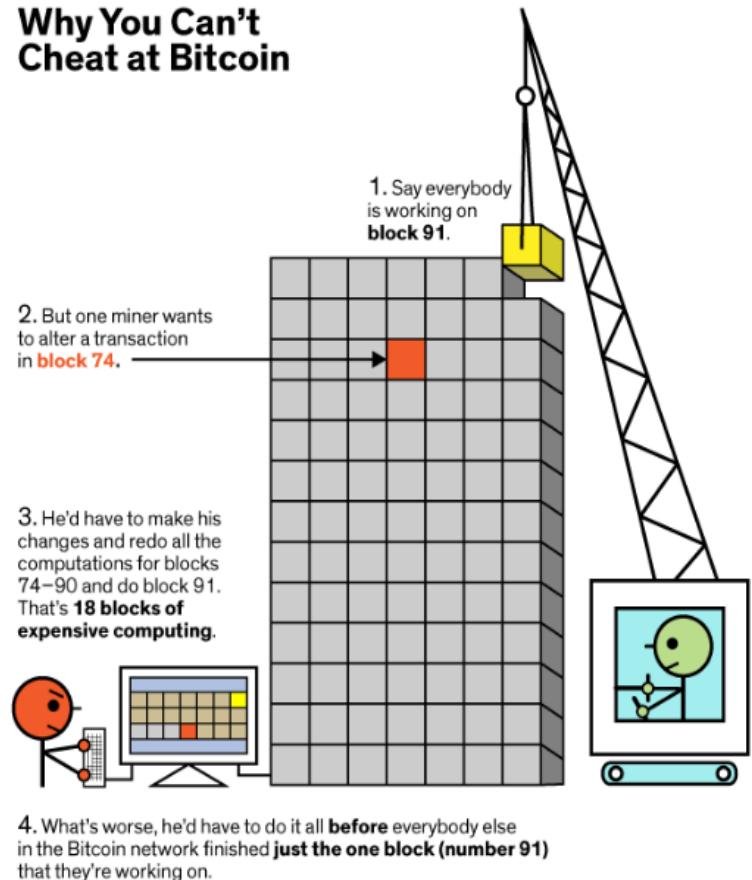
Trustless And Distributed Consensus

- A trustless and distributed consensus system means that if you want to send and/or receive money from someone you don't need to trust in a third-party

- With traditional payments, you need to trust in a third party to execute and record your transaction (e.g. Visa, Mastercard, PayPal, banks)
  - The third party has their own private register which stores transactions history and balances of each account

- The common example is the following: if party A sent party B $1000, the trusted third-party service would debit A's account and credit B's account, so they both have to trust this third-party

- With digital currencies, everyone has a copy of the ledger (blockchain), so no one has to trust in third parties, because anyone can directly verify the information written

Traditional Business Apps and the RDBMS

- Most business apps currently maintain data, including asset info and financial transactions, in relational databases (RDBMS)

- Multiple copies of the data are needed for operational considerations (logs and locks) as well as for backup and business continuity

- These RDBMS are for the most part centralized and unencrypted

- As well as being relatively expensive and inefficient, they are vulnerable to user errors, insider fraud, operational failures, and cyber security attacks

- Differences between databases within an organization and between organizations foster inconsistencies that necessitate expensive and time consuming reconciliation

59

Blockchain Applications

- **Hundreds of possible blockchain applications** have been identified including a number of applications in each of these categories:
  - Currency and banking
  - Accounting and auditing
  - Financial and other asset transfer
  - Contracts and public records (birth certificates, passports, voter ids, vehicle registers)
  - Private records (wills, trusts, warrantees, delivery receipts)
  - Supply Chain Digitization
  - Insurance
  - Rights protection (copyright, trademark)
  - Medical records
  - Reservations
  - Gambling

citi	Citi	Created own digital currency, CitiCoin, for internal money-moving tests
	Barclays	Working on proof-of-concept trial with Bitcoin exchange Safello; accepting charity donations in Bitcoin
	Bank of New York Mellon	Created own digital currency, BK Coins, for employee rewards
	UBS	Opened tech lab in London to explore blockchain applications

60

Non-Financial Use Cases

Digital Content/Documents, Storage & Delivery

BitProof, Blockcai, Ascribe, ArtPlus, Chainy.Link, Stampery, Blocktech (Alexandria), Bisantyum, Blockparti, The Rudimental, BlockCDN

Authentication & Authorization

The Real McCoy, Degree of Trust, Everpass, BlockVerify,

Digital Identity

Sho Card, Uniquid, Onename, Trustatom

Marketplace

Providing premium rights & brand based coins: MyPowers

Smart Contracts

Otonomos, Mirror, Symbiont, New system Technologies

Real Estate

Factom

Diamonds

Everledger

Gold & Silver

BitShares, Real Asset Co., DigitalTangible (Serica), Bit Reserve

Reviews/Endorsement

TRST.im, Asimov (recruitment services), The World Table

Blockchain in IoT

Filament, Chimera-inc.io, ken Code – ePlug

App Development

Proof of ownership for modules in app development: Assembly

Network Infrastructure & APIs

Ethereum, Eris, Codius, NXT, Namecoin, Colored Coins, Hello Block, Counterparty, Mastercoin, Corona, Chromaway, BlockCypher

Other

Prediction platform: Augur
Election Voting: Follow My Vote
Patient Records management: BitHealth

Financial Use Cases

Currency Exchange & Remittance

Coinbase (Wallet), BitPesa, Billion, Ripple, Stellar, Kraken, Fundrs.org, MeXBT, CryptoSigma

P2P Transfers

BTC Jam, Codius, BitBond, BitnPlay (Donation), DeBuNe (SME's B2B transactions)

Ride Sharing

La'zooz

Data Storage

Storj.io, Peernova

Trading Platforms

equityBits, Spritzle, Secure Assets, Coins-e, DXMarkets, MUNA, Kraken, BitShares

Gaming

PlayCoin, Play(on DACx platform), Deckbound

Investment/Adoption

- "Every major financial institution and technology company is investing in Blockchain" (Kiplinger 4/2018)
  - Faster & cheaper (avoid transaction fees)
- Bankers perhaps have the most to lose if they do not "get there first", so it's no surprise that "the world's central bankers are contemplating digital currencies of their own" (Economist Staff)
- Insurance companies, logistics companies, pharmaceutical companies and other industries are also exploring the possibilities of the Blockchain

Locally…

- Blockchain is being applied to food safety by Walmart and its suppliers via the Blockchain Food Safety Alliance collaboration in partners with IBM, Kroger, Unilever, nestle, Dole, Tyson, McCormic, etc.

- FedEx has begun efforts to integrate *blockchain* into its daily operations by joining the *Blockchain* in Transport Alliance (BiTA) developing a set of industry standards for freight tracking

Quantum Computing

- In quantum computing, a **qubit** or **quantum bit** (sometimes **qbit**) is a unit of quantum information—the quantum analogue of the classical bit

- A qubit is a two-state quantum-mechanical system, such as the polarization of a single photon: here the two states are vertical polarization and horizontal polarization

- In a classical system, a bit would have to be in one state or the other

- However, quantum mechanics allows the qubit to be in a superposition of both states at the same time, a property that is fundamental to quantum computing

Physical Implementations

Physical support	Name	Information support	$|0\rangle$	$|1\rangle$
Photon	Polarization encoding	Polarization of light	Horizontal	Vertical
	Number of photons	Fock state	Vacuum	Single photon state
	Time-bin encoding	Time of arrival	Early	Late
Coherent state of light	Squeezed light	Quadrature	Amplitude-squeezed state	Phase-squeezed state
Electrons	Electronic spin	Spin	Up	Down
	Electron number	Charge	No electron	One electron
Nucleus	Nuclear spin addressed through NMR	Spin	Up	Down
Optical lattices	Atomic spin	Spin	Up	Down
Josephson junction	Superconducting charge qubit	Charge	Uncharged superconducting island (Q=0)	Charged superconducting island (Q=2e, one extra Cooper pair)
	Superconducting flux qubit	Current	Clockwise current	Counterclockwise current
	Superconducting phase qubit	Energy	Ground state	First excited state
Singly charged quantum dot pair	Electron localization	Charge	Electron on left dot	Electron on right dot
Quantum dot	Dot spin	Spin	Down	Up

Quantum Computation Usage

- Faster computation, more operations in parallel for AI and other computationally intensive operations

- Cyber security encryption and decryption

- Faster data communications – sending the same number of pulses along the wire or fiber optic cable – but each pulse has more information (a qubit instead of a bit)

  - In 2017 Oak Ridge Lab (ORNL) in TN transferred 1.67 bits per qubit over a fiber optic cable

66

DNA Data Storage

- Scientists have long touted DNA's potential as an ideal storage medium; it's dense, easy to replicate, and stable over millennia

- In the past few years, researchers have encoded all kinds of things in those strings of As, Ts, Cs, and Gs

- But in order to replace existing silicon-chip or magnetic-tape storage technologies, DNA will have to get a lot cheaper to predictably read, write, and package

- Catalog, an MIT DNA-storage spinoff emerging out of stealth on Tuesday, has come a long way since encoding their first poetic kilobyte by hand a year and a half ago

- Now they're building a machine that will write a terabyte of data a day, using 500 trillion molecules of DNA

DNA Data Storage (con't)
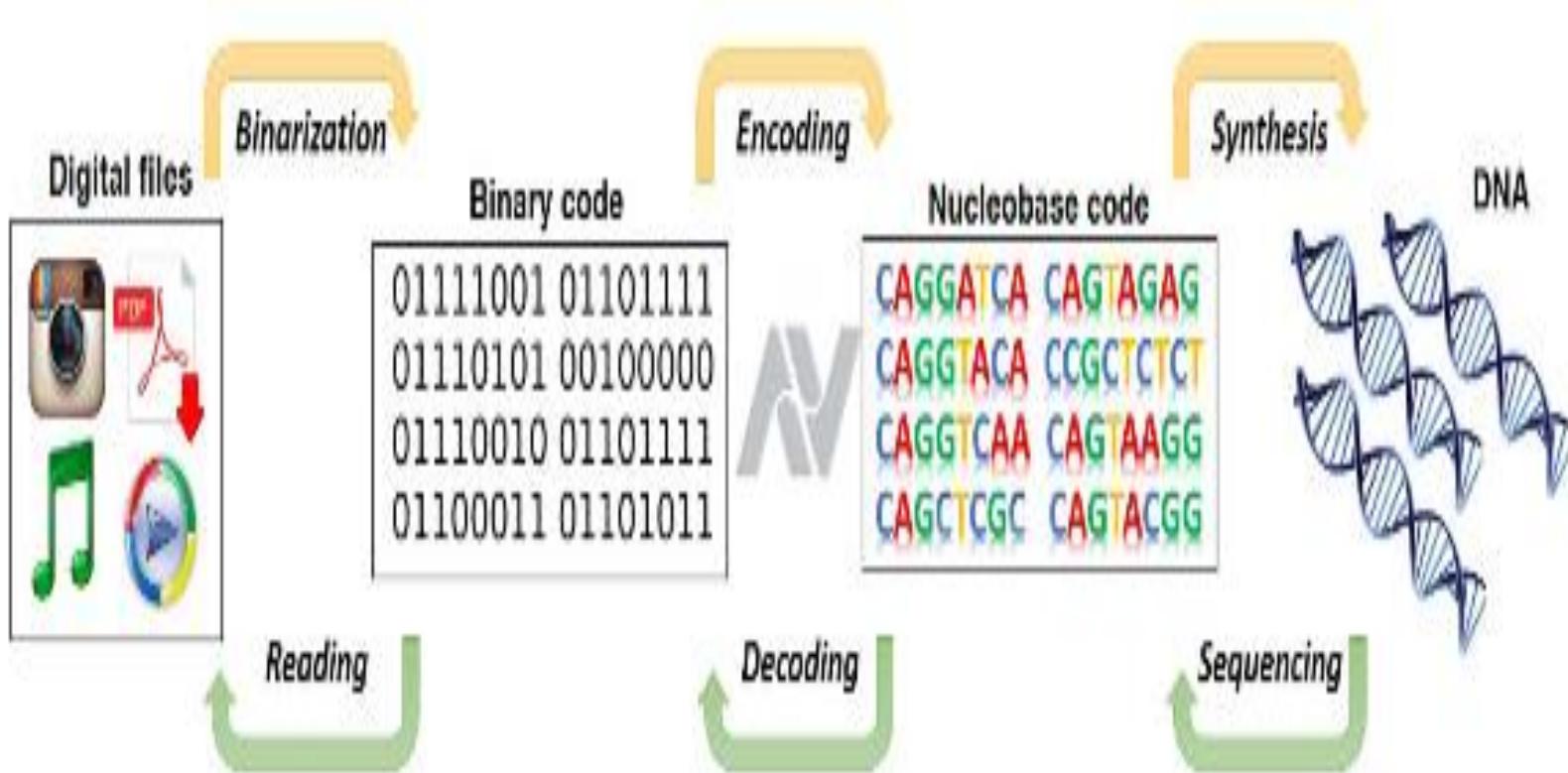
DNA Data Storage (con't)

- DNA storage could be the answer to a uniquely 21st-century problem: information overload

- Five years ago humans had produced 4.4 zettabytes of data; that's set to explode to 160 zettabytes (each year!) by 2025

- Current infrastructure can handle only a fraction of the coming data deluge, which is expected to consume all the world's microchip-grade silicon by 2040

- Most digital archives—from music to satellite images to research files—are currently saved on magnetic tape. Tape is cheap. But it takes up space. And it has to be replaced roughly every 10 years

- Today's technology is already close to the physical limits of scaling

- DNA has an information-storage density several orders of magnitude higher than any other known storage technology

- How dense exactly? Imagine formatting every movie ever made into DNA; it would be smaller than the size of a sugar cube. And it would last for 10,000 years

DNA Data Storage (con't)

- The trouble of course, is cost. Sequencing—or reading—DNA has gotten far less expensive in the last few years; but the economics of writing DNA remain problematic if it's going to become a standard archiving technology

- Catalog thinks it can rewrite those cost curves by decoupling the process of writing DNA from the process of encoding it

- Traditional methods map the sequence of bits—0s and 1s—onto a sequence of DNA's four base pairs

- In 2016, when Microsoft set a record by storing 200 megabytes of data in nucleotide strands, the company used 13,448,372 unique pieces of DNA

- What Catalog does, instead, is cheaply generate large quantities of just a few different DNA molecules, none longer than 30 base pairs; then it uses billions of enzymatic reactions to encode information into the recombination patterns

Flying Cars & Taxis

Recession Proof Your Career
(Yahoo Finance – 2019)

RECESSION-PROOF INDUSTRIES AND JOBS, BY MEDIAN PAY

RECESSION-PROOF INDUSTRY / Job Title	OVERALL MEDIAN PAY
CLOUD COMPUTING — Information Technology (IT) Architect	$126K
ARTIFICIAL INTELLIGENCE (AI) — Software Developer	$83.7K
BIG DATA ANALYTICS — Data Scientist	$99.1K
CYBER SECURITY — Cyber Security Analyst	$76K
DIGITAL MARKETING — Marketing Manager	$66.2K

SOURCE: PAYSCALE

YAHOO! FINANCE

Space Exploration

- Space – The Final Frontier
- Why spend so much money on space exploration?
  - Explore the mysteries of space
  - Protecting our planet and our environment
  - Providing advancements in technology
  - Allows us to prove or disprove scientific theories developed on Earth
  - Finding life on other planets
  - International collaboration
  - Military applications

Thinking…

?

Don't look ahead !

Space Exploration (con't)

- There is more wealth on an average asteroid than all the money currently in the world

- According to NASA, the minerals that lie in the belt of asteroids between Mars and Jupiter hold wealth equivalent to **a staggering $100 billion for every person on Earth**

Space Exploration

- US
    - NASA
    - SpaceX
    - Blue Origin
    - Boeing
    - Northrop Grumman
    - Lockheed Martin
    - Sierra Nevada
- China
- Japan
- Russia
- Germany
- France

Mankind Ages

- **Stone Age** — 3.4 million years
- **Bronze Age** — 2,500 years
- **Iron Age** — 500 years
- **Industrial Revolution** — 80 years
- **Information Revolution** — 20 years

Age of the Robot

▼ AI software revenue
- North America
- Asia-Pacific
- Europe
- Other regions

Projected

$120b

60

0

2018   2025
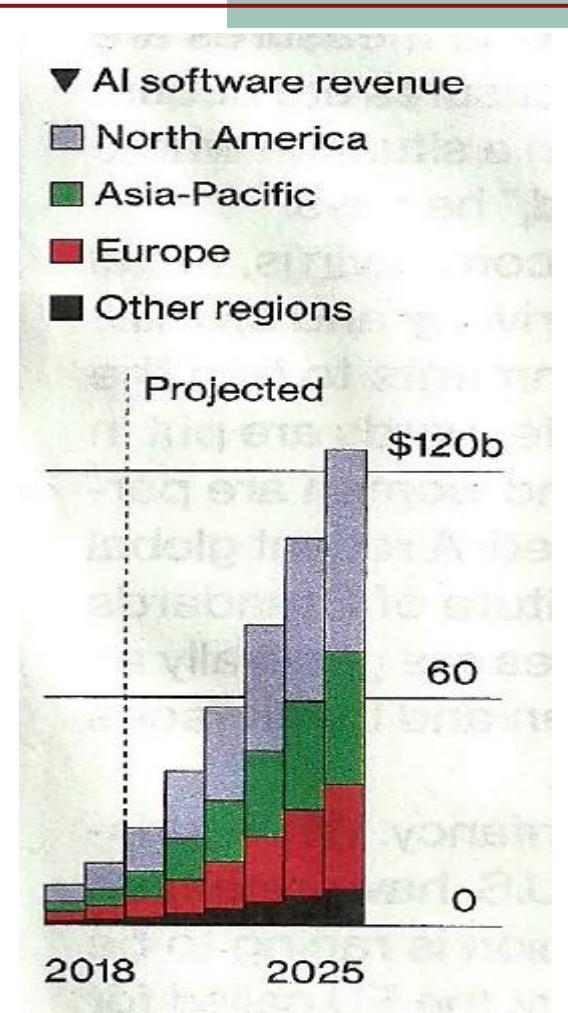
Spread of Robots

- According to a new study by researchers at MIT and Boston University, the rise of industrial robots increased fourfold between 1990 to 2007 to around one robot per every thousand workers

- That one robot, the research found, reduces the aggregate employment-to-population ratio by 0.34 percentage points, that's equivalent to "one new robot reducing employment by 5.6 workers"; one robot can depress wages by 0.25% to 0.5%.

- A look around today shows no telephone switchboard operators, elevator operators, assembly-line welders or video-rental stores

- Now cars that drive themselves are on the road in some places

- Automation is becoming impossible to ignore; as domestic manufacturing has boomed in recent years, that sector's employment has declined considerably

Spread of Robots (con't)

- And to throw salt in the wound, the robots taking jobs are mostly foreign-made

- Automation is accelerating, but it hasn't reached a critical threshold quite yet

- The number of jobs lost to robots has been between 360,000 and 670,000 from 1990 to 2007

- However, if the spread of robots proceeds as expected by experts over the next two decades, the human job replacement will be enormous

The Kiplinger Letter

Dear Client:

Washington, June 10, 2016

<u>Lots of fretting about jobs these days</u>... especially given the slowing trend in hiring since Feb., as amplified by the paltry 38,000 jobs added in May, and the many people who've given up looking for work.

<u>Adding to the concerns</u> and overall angst: <u>The relentless march of automation</u>... robots and other productivity-enhancing machines that will continue to displace people in the workplace.

<u>Folks without skills will take the biggest hit</u>. Coming increases in the minimum wage in many states and cities are sure to advance employers' efforts to automate low-skill jobs...parking lot attendants, order takers, front counter workers and the like.

JOBS <u>But for skilled workers, the future is bright</u>. May's job report is noteworthy for occupations that are not affected by the slowdown in hiring... chiefly tech, accounting, consulting and health care.

<u>In fact, employers find it hard to fill many jobs</u> in fields that require sophisticated technical skills along with an ability to communicate effectively while leading and influencing teams of colleagues.

<u>Successful implementation of technology requires a slew of experts</u> in well-compensated positions, ranging from big data and cybersecurity specialists to software and mobile app developers. Also computer network administrators, systems engineers, programmers of all stripes and wireless network engineers.

<u>Greater use of digitized video for marketing and more is opening up jobs</u> in motion graphics and customer experience design, marketing automation and other specialties that didn't exist a few years ago. Recent college grads and others that specialize in such fields are often seeing multiple offers from top-notch firms.

ECONOMIC FORECASTS

GDP growth
Accelerating in second-half '16;
2% for the year

Interest rates
10-year T-notes at 2.1% by end '16;
30-year mortgages at 3.9%

Inflation
2.4% by end '16,
up from 0.7% at end '15

Unemployment
Ending '16 at 4.7%,
where the rate is now

Crude oil
Trading from $40 to $45/bbl.
by July 4

Disposable income
Rising 2.9% in '16 vs. 3.4% in '15,
after adjusting for inflation

Complete economic outlook at
kiplinger.com/outlooks

The Robot Revolution
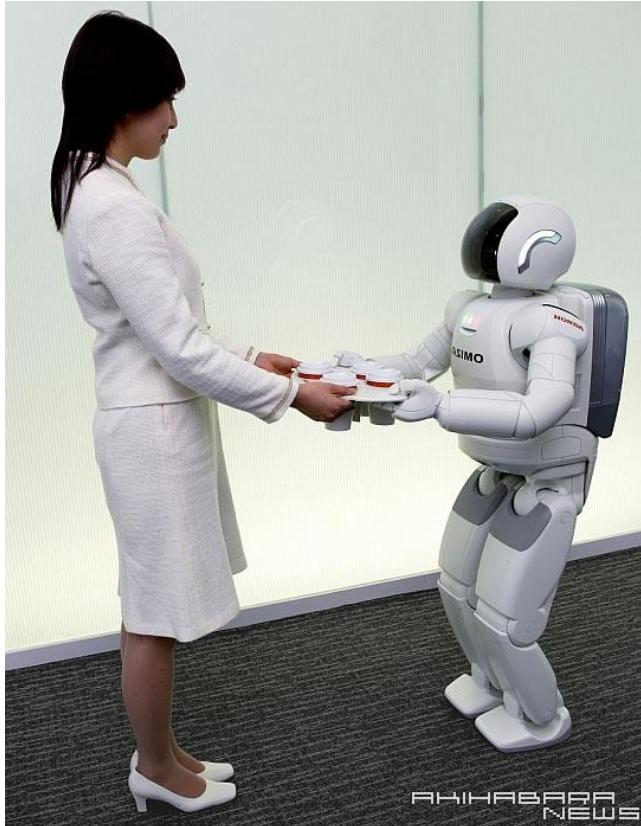
Honda's ASIMO robot

700 robots used in making the Ford Escape

Robots are better, cheaper, faster, than people; and robots can work 24x7, don't complain, don't get sick, don't unionize, etc.

Asimo

'Asimo' smarter and more limber

Honda officials see robot helping with nuclear crisis

By YURI KAGEYAMA
Associated Press

WAKO, Japan — Honda's human-shaped robot can now run faster, balance itself on uneven surfaces, hop on one foot and pour a drink. Some of its technology may even be used to help out with clean-up operations at the stricken Fukushima nuclear plant.

Honda's demonstration of the revamped "Asimo" on Tuesday at its Tokyo suburban research facility was not only to prove that the bubble-headed childlike machine was more limber and a bit smarter.

It was a way to try to answer some critics that Asimo, first shown in 2000, had been of little practical use so far, proving to be nothing more than a glorified toy and cute showcase for the Honda Motor Co. brand.

Honda President Takanobu Ito told reporters some of Asimo's technology was used to develop a robotic arm in just six months with the intention of helping with the nuclear crisis in northeastern Japan.

The mechanical arm can open and close valves at Fukushima Dai-ichi nuclear power plant, which went into meltdown after the March tsunami, according to Honda. The automaker is working with the utility behind the problem plant, Tokyo Electric Power Co., to try to meet demands to bring the plant under control.
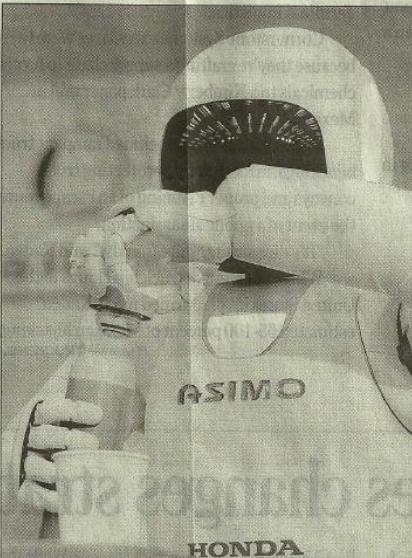
Ito acknowledged that the first idea was to send in Asimo to help out, but that was not possible because the robot cannot maneuver in rubble, and its delicate computer parts would malfunction in radiation.

But in Tuesday's demonstration, Asimo was able to walk without falling over 0.8

inch padded bumps on the floor.

It can also now jog faster than it did in 2005, at 5.6 mph, instead of the earlier 3.7 mph, pushing better with its toes so its run was smoother and not as jerky.

Asimo was also able to distinguish the voices of three people spoken at once, using face recognition and analyzing sound, to figure out that one woman wanted hot coffee, another orange juice, and still another milk tea.

The new Asimo got improved hands as well, allowing individual movement of each finger, so it could do sign language.

"My name is Asimo," it said, making the signs of its words with stubby fingers.

It also opened a thermos bottle and gracefully poured juice into a paper cup.

Ito said Asimo had developed autonomous artificial intelligence so that it could potentially maneuver itself through crowds of people, without remote control or stopping each time to check on its programming.

But he acknowledged that making robotics into a practical business will take more time, meaning Asimo wasn't about to show up in any home soon.

"Maybe at the start this was a dream of engineers to make a machine that was close to a human being, like Astro Boy," he said. "We think Asimo is good."

Itsuo Inouye/Associated Press

Honda's revamped human-shaped robot "Asimo" opens a thermos bottle before pouring the drink into a cup during a news conference in Wako, near Tokyo, on Tuesday.

The daVinci Surgical Robot

400,000 surgeries aided by robots each year now

The robot

The surgeon's console

AI vs Humans in Medicine
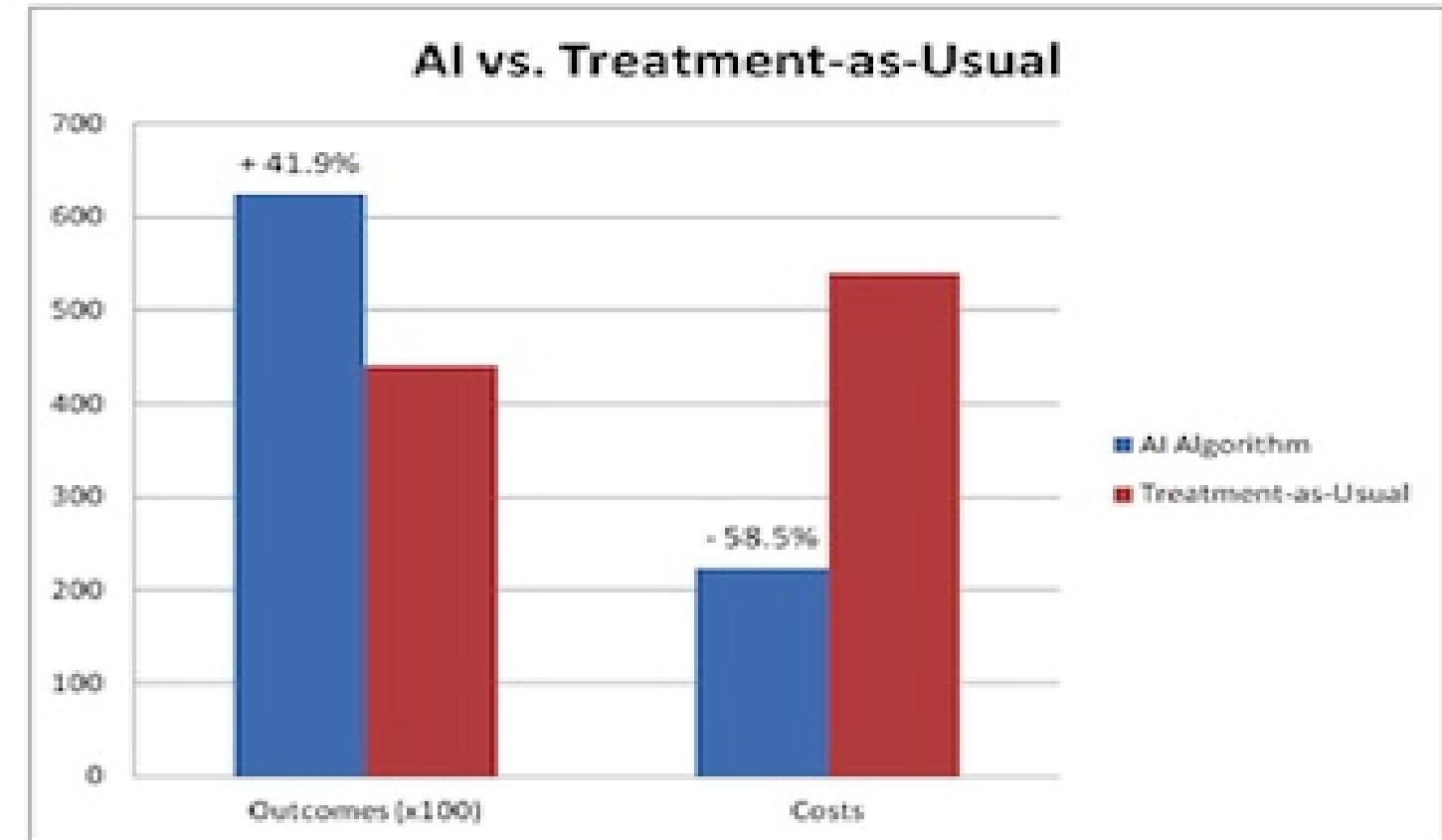
AI results vs. typical physician treatment (Source: Indiana University)

Amazon Robots

Order something from Amazon, and it's likely a robot will help get it to you.

The tech giant had 200,000 robotic vehicles moving goods through its U.S. warehouses by the holiday rush of 2019. That's double what it had in 2018 and up from 15,000 in 2014.

Amazon says it also doubled the number of warehouses where those wheeled robots operate, to 50 in 2019. The machines are speeding up delivery times and cutting costs, though there are concerns they're also adding stress and strain to the jobs of warehouse workers.

Amazon's robotic transformation has its roots in its $775 million purchase of Massachusetts startup Kiva Systems in 2012.

Amazon's rivals have taken note, helping to fuel an investment boom in warehouse robotics startups that ABI Research says reached $1.5 billion a year in 2015.

Shopify spent $450 million in October to buy Massachusetts-based startup 6 River Systems, while Amazon acquired another robot-maker, Colorado-based Canvas Technology, earlier in the year. Both make robotic carts that are more autonomous than Amazon's current lineup.

## Robotic vehicles used in Amazon warehouses

Robot-makers say their machines are taking on the most mundane and physically strenuous tasks. In reality, they are also creating new forms of stress and strain. Amazon is leading this robotic push with more than 200,000 robotic vehicles moving goods through its U.S. warehouses.
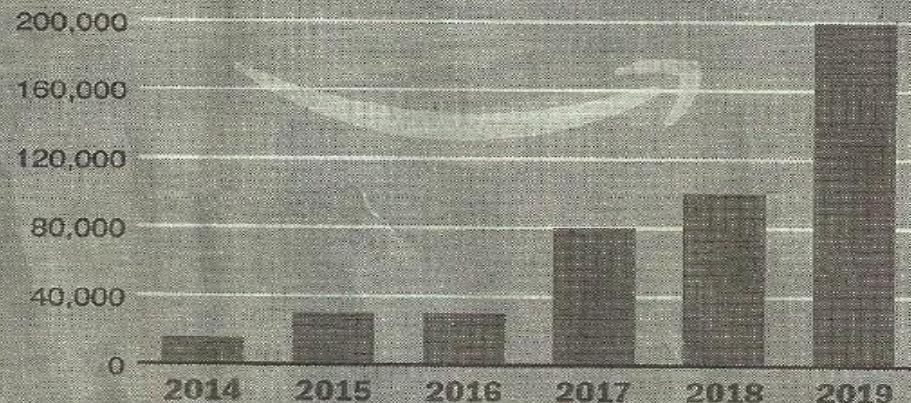
Today's Robots

- Companies continue to invest tens of millions on research for development of robots
- Honda alone spent over $100 million in the last 15 years to develop human like robots
- Sony's predicts that in a few years there will be at least 1-3 robots in each household
- Wabot-2 is a humanoid robot who reads music and plays the piano
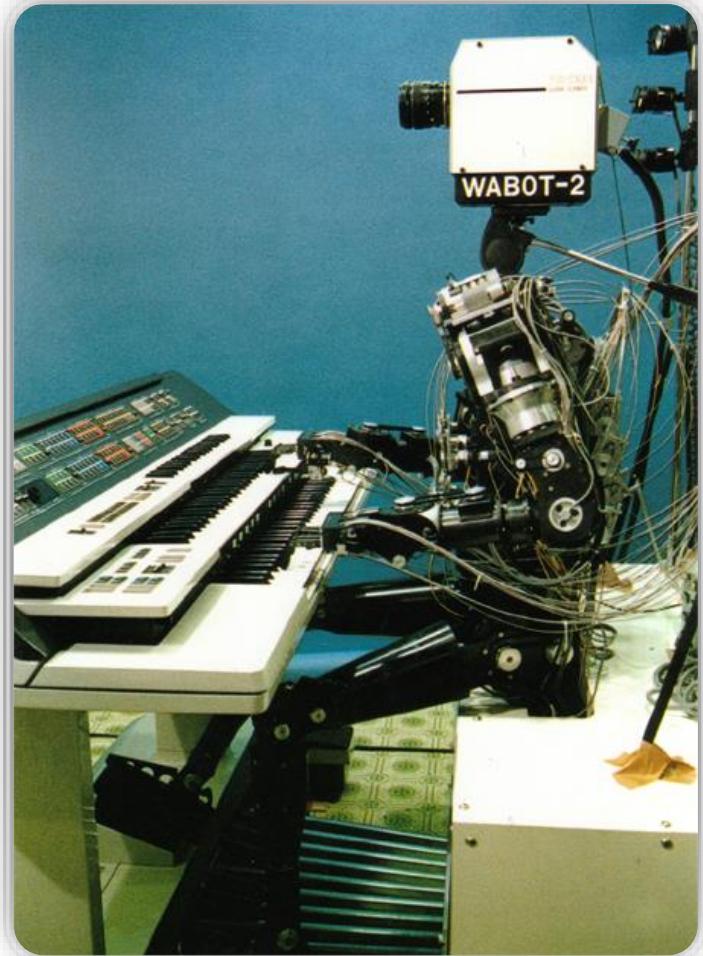
Today's Robots (con't)

Robot Junko Chihira who serves as a greeter to customers, speaks in Japanese, Chinese and English

> She cannot walk, but will be used to help foreigners for the upcoming 2020 Japan Olympics

⑩ Actroid-DER2 is one of the most realistic robots, being able to create exotic facial expressions and follow any command

Both are currently used in healthcare, and hospitality sectors, but will in the future be used in many more sectors

Today's Robots (con't)

ROBOTS CEMENT THEIR PLACE IN CONSTRUCTION

Startups are working to automate different jobs within the building industry. Here are a few examples.

FBR

This company's Hadrian X robot has a mechanical arm mounted on a truck that builds walls faster than humans, with bricks that are 12 times as big as traditional ones.

EKSO BIONICS

Its vest supports workers' arms and backs to provide superhero strength, reducing fatigue and injury. A separate robotic arm makes heavy tools seem weightless.
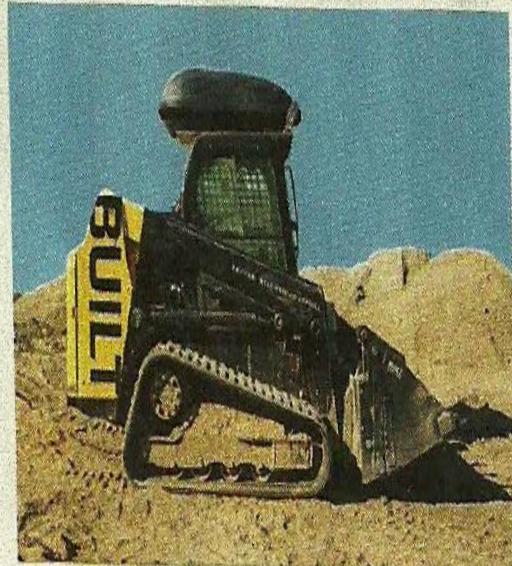
BUILT ROBOTICS

A system of cameras, GPS, sensors, and A.I. turns bulldozers and other heavy equipment into autonomous vehicles that can dig without human operators.

Sophia

- A humanoid robot
- Developed by the Company Hanson Robotics, based in Hong Kong
- Activated on February 14, 2016
- She became a Saudi Arabien citizen in October 2017

  -> First robot ever to earn a citizenship
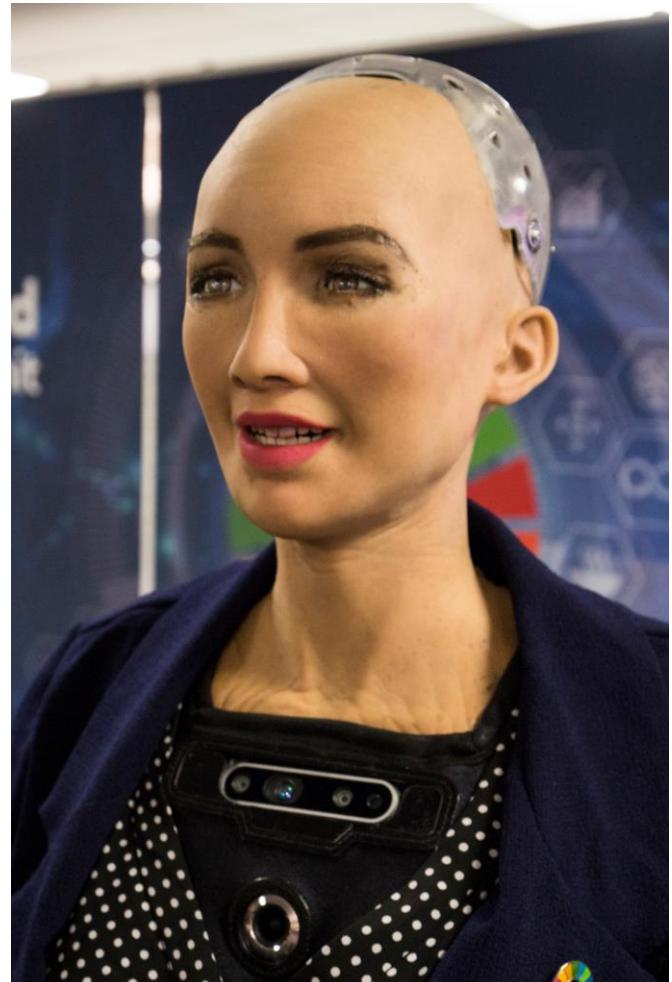
Sophia's Features

- Cameras within Sophia's eyes combined with computer algorithms
  - Allow her to see
  - Enable her to follow faces
  - Enable her to sustain eye contact
  - Allow her to recognize individuals
- Sophia can process speech and have a conversation using a natural language subsystem

Sophia's Features (con't)

- Software is programmed to give pre-written respones to specific questions or phrases
  - Makes it seems like Sophia can understand a conversation
- Functional legs give Sophia the ability to walk
- Her AI is constantly being trained
  - Her conversations are likely to get faster
  - Her expressions are having less errors
  - Her capability of answering complexer questions increases

Sophia's Accomplishments

- She now has voice recognition
- 2019 the artist Patrick Tresset taught her how to draw in 7 months
  - She drew a portrait of the Prime Minister of Malaysia and of Holly Willoughby
- Works nursing homes and to help crowds at large events or parks
- November 21, 2017: Sophia was named the United Nations Development Programmer's first ever Innovation Champion for Asia and the Pacific

Job Replacement by Robots

- About 50% of total US employment is at risk of being replaced by machines over the next two decades

- "A material shift in the composition of the labor force would result as demand for low skilled labor remains robust as many personal in-person services are not yet replaceable by machines

- "Hence, the bifurcation in productivity of the workforce to low and high-skilled could be weighing on average productivity growth"

Probability of a Job Being Automated

Job	Probability
Loan Officers	98%
Receptionists and Information Clerks	96%
Paralegals and Legal Assistants	94%
Retail Salespersons	92%
Taxi Drivers and Chauffeurs	89%
Security Guards	84%
Cooks, Fast Food	81%
Bartenders	77%
Personal Financial Advisors	58%

Source: University of Oxford, C.B. Frey and M. Osborne, Morgan Stanley Research
Note: Select occupations ranked according to their probability of becoming automatable,

Brave new world of robots and lost jobs

DAVID IGNATIUS

COLUMNIST

WASHINGTON— Job insecurity is a central theme of the 2016 campaign, fueling popular anger about trade deals and immigration. But a look at the numbers suggests America is having the wrong debate.

Economic security won't come from renegotiating trade deals, as Donald Trump claimed in a speech in Detroit Monday, or rebuilding infrastructure, as Hillary Clinton argued in Warren, Michigan, Thursday. These are palliatives.

Our deeper problem is how to provide meaningful work and good wages for the tens of millions of truck drivers, accountants, factory workers and office clerks whose jobs will disappear in coming years because of robots, driverless vehicles and "machine learning" systems.

The political debate needs to engage the taboo topic of guaranteeing economic security to families — through a universal basic income, or a greatly expanded earned-income tax credit, or a 1930s-style plan for public-works employment. Ranting about bad trade deals won't begin to address the problem.

The "automation bomb" could destroy 45 percent of the work activities now performed in the U.S., representing about $2 trillion in annual wages, according to a study last year by the consulting firm McKinsey & Co. We've only seen the start of this change, they warned. Now, only 5 percent of occupations can be entirely automated, but 60 percent could soon see machines doing 30 percent or more of the work.
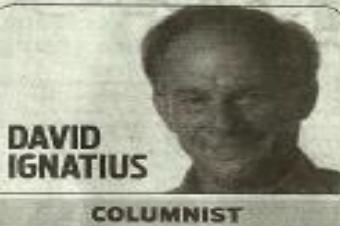
The McKinsey analysts sharpened their argument in a new paper released last month. Their estimates, based on U.S. Bureau of Labor Statistics data covering more than 800 occupations, drew a shocking picture of the future. In manufacturing, 59 percent of activities could be automated, and that includes "90 percent of what welders, cutters, solderers and brazers do." In food service and accommodations, 73 percent of the work could be done by machines. In retailing, 53 percent of current jobs could be lost.

White-collar workers may imagine they're safe, but that's wishful thinking. If computers can be programmed to understand speech as well as humans do, 66 percent of jobs in finance and insurance could be replaced, for example, McKinsey warns.

Robots are replacing workers around the world. The density of robots per 10,000 workers is higher in Japan and Germany than in the U.S., the White House Council of Economic Advisers says. In last February's "Economic Report of the President," they cited research noting that "middle-skill" employees, such as bookkeepers, clerks and assembly-line workers have been replaced first, but that "big data and machine learning will soon make it possible to automate many tasks that were difficult to automate in the past."

Workers are already reeling from the job implosion we've seen so far. A study released last week by Bruce Stokes of the Pew Research Center found that 89 percent of Americans surveyed thought "the loss of U.S. jobs to China" was a serious issue. That anxiety translates into growing skepticism about free trade. As of March, 51 percent of Americans still thought free-trade deals were a good thing, but that was down from 59 percent two years ago.

Pew data shows that the people most likely to oppose trade deals are older white men, the people whose former job security has probably been most affected by the modern, global economy. Free trade agreements are supported by 54 percent of women; 55 percent of blacks; 67 percent of young adults between 18 and 29; and 72 percent of Hispanics. Young, diverse Americans seem to accept the disruptions that are part of the global, high-tech economy.

This campaign has distilled the populist rage at elites who are seen to have benefited from globalization while blue-collar workers have suffered. This anti-elitism is only likely to grow as vast new sectors of the economy are transformed by the Silicon Valley technologies that have created a new class of American billionaires. People shouldn't hate the future, or the technologists who are building it, but this anger could become a polarizing fixture of the national mood.

Politicians need to begin thinking boldly, now, about a world where driverless vehicles replace most truck drivers' jobs, and where factories are populated by robots, not human beings. The best way to cushion this future is to start planning for how Americans will be able to take care of their families — and find meaningful work — in a world where most traditional jobs have vanished.

Contact David Ignatius at davidignatius@washpost.com.

Sectors by activity type	Manage	Expertise	Inter-face	Unpredict-able physical	Collect data	Process data	Predict-able physical	Automation potential %
Accommodation and food services								73
Manufacturing								60
Agriculture								58
Transportation and warehousing								57
Retail trade								53
Mining								51
Other services								49
Construction								47
Utilities								44
Wholesale trade								44
Finance and insurance								43
Arts, entertainment, and recreation								41
Real estate								40
Administrative								39
Health care and social assistances								36
Information								36
Professionals								35
Management								35
Educational services								27

SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

Ameca Humanoid Robot AI Platform

Technological Singularity

[singularity – an event horizon that is difficult to see beyond]
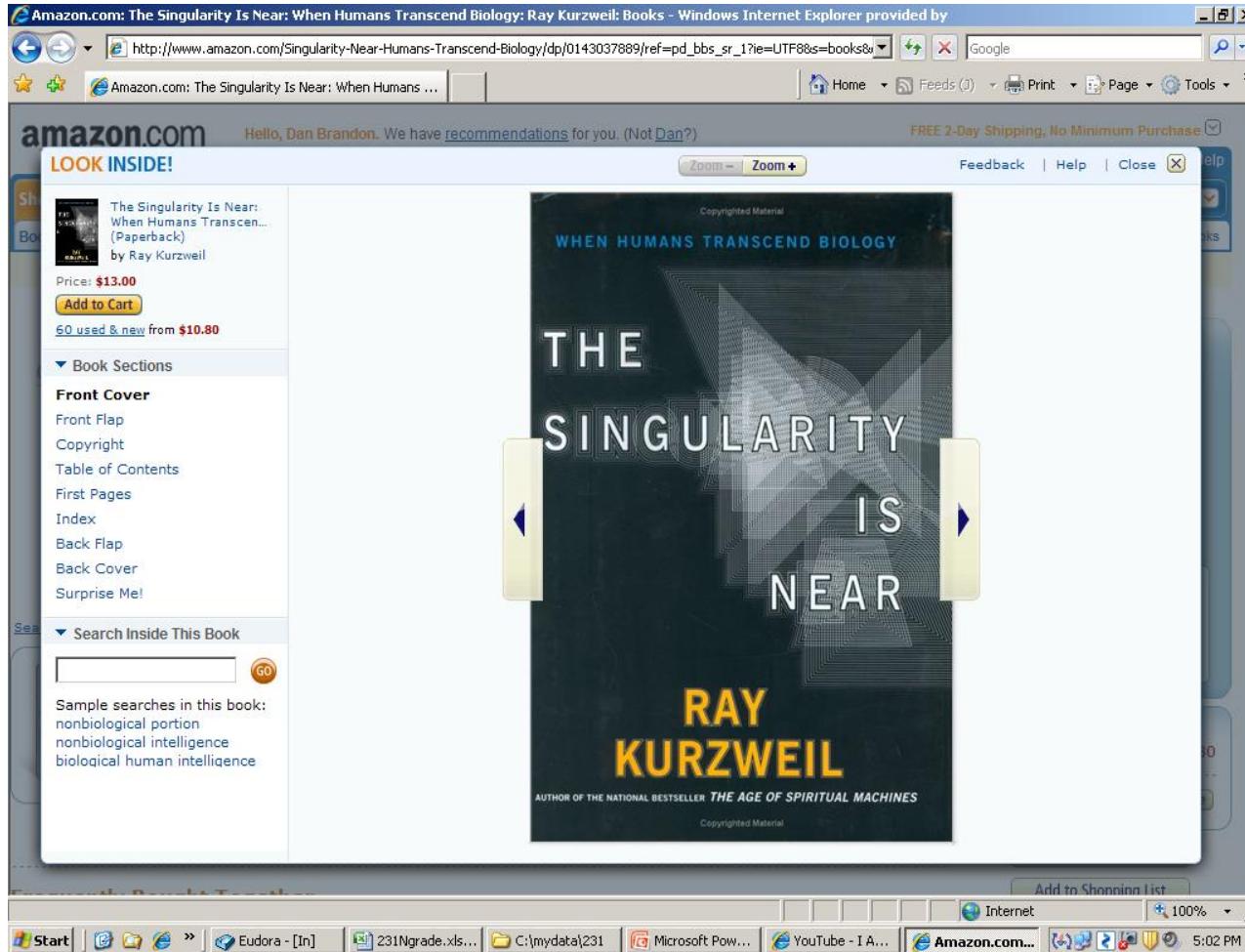
"Technological Singularity"

- The point at which machines become more intelligent than humans

- The point at which humans begin to serve machines instead of machines serving humans

Fact or Science Fiction?

["I'll be back"…Terminator]
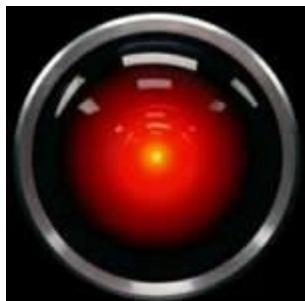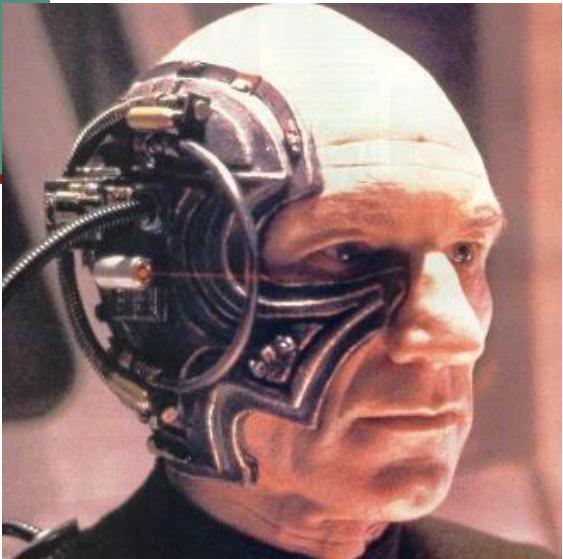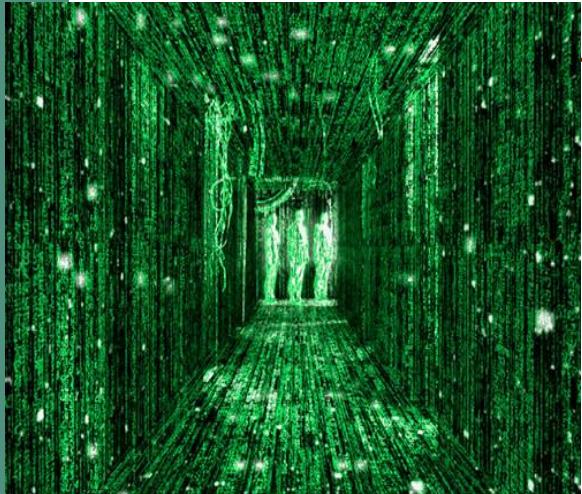
Computer Capacity

- According to Ray Kurzweil's predictions (Taken from The Age of Spiritual Machines (1998)
    - 2019 - A $1,000 personal computer has as much raw power as the human brain.
    - 2029 - A $1,000 personal computer is 1,000 times more powerful than the human brain.
    - 2029 - Computer implants designed for direct connection to the brain are also available. They are capable of augmenting natural senses and of enhancing higher brain functions like memory, learning speed and overall intelligence.
    - 2029 - Computers are now capable of learning and creating new knowledge entirely on their own and with no human help. By scanning the enormous content of the Internet, some computers literally every single piece of public information (every scientific discovery, every book and movie, every public statement, etc.) generated by human beings.
    - 2099 - The human brain has been completely reverse engineered and all aspects of its functioning are understood.
    - 2099 - Natural human thinking possesses no advantages over computer minds.
    - 2099 - Machines have attained equal legal status with humans.
    - 2099 - Humans and machines merge together in the physical and mental realms.

TIME Magazine

1 The accelerating pace of change …

Agricultural Revolution ← 8,000 years → Industrial Revolution ← 120 years → Light-bulb ← 90 years → Moon landing ← 22 years → World Wide Web ← 9 years → Human genome sequenced

2045 Surpasses brainpower equivalent to that of all human brains combined

10^{26}

10^{20} Surpasses brainpower of human in 2023
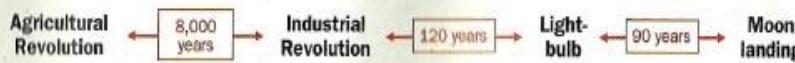
2 … and exponential growth in computing power …

Computer technology, shown here climbing dramatically by powers of 10, is now progressing more each hour than it did in its entire first 90 years

3 … will lead to the **Singularity**

Apple II
At a price of $1,298, the compact machine was one of the first massively popular personal computers

10^{15} Surpasses brainpower of mouse in 2015

COMPUTER RANKINGS
By calculations per second per $1,000

Colossus
The electronic computer, with 1,500 vacuum tubes, helped the British crack German codes during WW II

UNIVAC I
The first commercially marketed computer, used to tabulate the U.S. Census, occupied 943 cu. ft.

Nvidia Tesla GPU & PC

Mac Pro

Dell Dimension 8400

10,000,000,000

Analytical engine
Never fully built, Charles Babbage's invention was designed to solve computational and logical problems

Data General Nova

IBM PC

Pentium II PC

Pentium PC

Compaq Deskpro 386

100,000

Whirlwind

DEC PDP-4

IBM 1130

DEC PDP-10

Intellec-8

BINAC

ENIAC

IBM 1620

Power Mac G4
The first personal computer to deliver more than 1 billion floating-point operations per second

1

IBM SSEC

EDVAC

Datamatic 1000

IBM Tabulator

Zuse 3

Zuse 2

Hollerith Tabulator

National Ellis 3000

0.00001

ELECTROMECHANICAL —— RELAYS —— VACUUM TUBES —— TRANSISTORS —— INTEGRATED CIRCUITS

1900   1920   1940   1960   1980   2000   2011   2020   2045

Obsolescence of Humans ???

- When (not if) technology moves far ahead of humans, how will humans possibly survive?
  - Destroy machines
  - Be replaced with machines
  - Merge with Machines
    - Actual DNA merger

The Economist, 2015

I've made predictions before that concern, upset, even enrage people. But this time, the forecast I'm most passionate about has triggered a different reaction: it's terrifying people.

For four decades, my speciality has been to spot trends which can be troubling to our clients. (In 1988, for example, we told Kodak, forget film, digital is the future; they fired us.) We "braille the culture" and sense where deep changes in the consumer landscape are emerging. We have a global network of 127 trend-spotters and we go on "TrendTreks"—walkabouts in which we explore places where the future is bleeding into the present. Once you know how to tune in to the signals, the shape of tomorrow is easy to discern.

Now, here's the prediction that no one seems to want to believe: the robots are coming. And we will be merging, mating and morphing with them.

Think about it; we're already becoming mechanised. Knee and hip replacements: no big deal. A Google contact lens that measures your blood sugar: all good. The Swedish fingertip chip that lets employees unlock the office and fire up the copier: easy, breezy. But look deeper:

- A Spanish cancer survivor has received the first 3D-printed titanium chest prosthetic. In a few years we'll have people walking among us who are partially—perhaps mostly—3D-printed.
- Pioneering scientists are developing prosthetics controlled by mind, not muscle. At Johns Hopkins, a double arm-amputee can think, "I'd like a sip of that coffee," and his augmented body responds. Beautiful. Now imagine those with bone and muscle diseases benefiting from those lab-made limbs. Think of the day we tell our body: "Fly!"
- At the Royal Melbourne Institute of Technology, researchers have created the world's first electronic memory cell. The bionic brain will soon be here, and who wouldn't want a boost, something to amp up our memory? And someday pass it on to our children.

Now, here's the prediction that no one seems to want to believe: the robots are coming. And we will be merging, mating and morphing with them.

The Economist, 2015 (con't)

- And how about the wireless brain implant, the size of a grain of rice, which Stanford researchers say can obliterate a bad mood? Imagine being able to sign up for a jolt of optimism. What happens to the multi-billion-dollar pharma industry that manufactures the serotonin re-uptake-inhibitor drugs Lexapro, Paxil, Zoloft and Prozac? Gone as fast as a mood swing.

Here's where the fear factor kicks in: we're no longer merely dealing with mechanised body parts. We're re-engineering our minds, our spirit, our souls. Our species is racing from "robot knees" to "robot brain": a brain smarter and more able than the kind you were born with, one that doesn't have to learn but simply uploads knowledge in a millisecond. Either embrace it, or be left seriously in the dust.

It's not just we humans who are evolving. Our automatons are, too. Early indicators of what's to come are already here to see:

- Adorable bots—Echo, Jibo, NAO and Pepper—are marching into our homes to help our kids with homework and bedtime stories.
- In Japan, robotic caregivers tend to the elderly and play concierge at deluxe hotels. I don't think I need to describe how this tech develops into sex robots. Let your imagination take you to a perfectly matched partner who knows your every desire.
- In Swiss labs, robots developed both altruism and deceitfulness on their own.

So back to my prediction. There's a huge merge/morph/meld ahead: humans enhanced by technology; robots infused with humanity. And then: breeding with each other—their "DNA", our DNA, new DNA. A transformation of our species awaits, and 2016 is when the average human slowly, sleepily awakens to the new dawn of RoboHumanity. ■
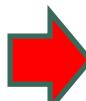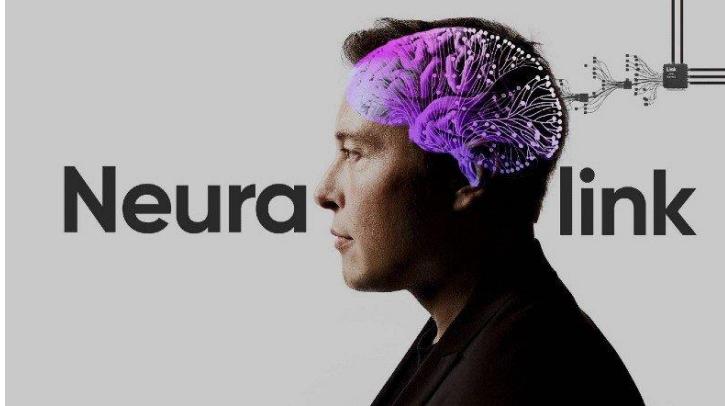
Neuralink

- **Neuralink is one of Elon Musk's strange and futuristic companies**
- **It's developing neural interface technology — a.k.a. putting microchips in people's brains**
- **The technology could help study and treat neurological disorders as well as begin human robot merging**

Neuralink (con't)
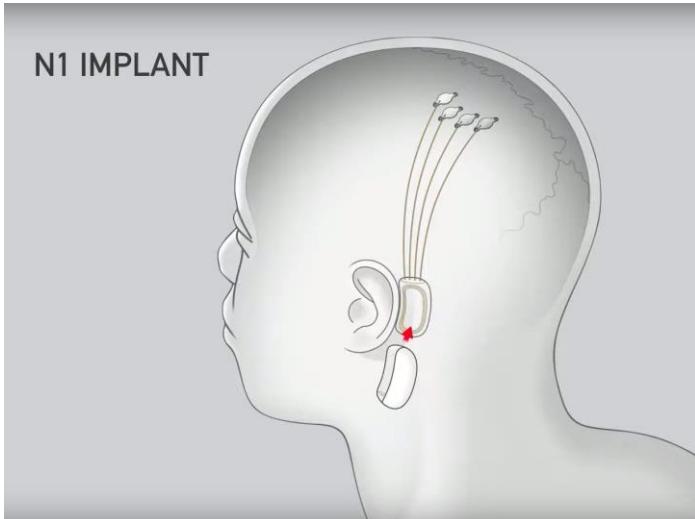
N1 IMPLANT

- Neuralink is developing two bits of equipment
- The first is a chip that would be implanted in a person's skull, with electrodes fanning out into their brain
- The chip is embedded in a person's skull
- From the chip, an array of tiny wires, each roughly 20 times thinner than a human hair, fan out into the patient's brain

Neuralink (con't)

- The second development is a robot that could automatically implant the chip
- The robot would work by using a stiff needle to punch the flexible wires emanating from a Neuralink chip into a person's brain, a bit like a sewing machine

Neuralink (con't)

- Neuralink started animal demos in April 2021, when it showed off a monkey playing video games with its mind

- Pager (the test subject) played the games using a joystick that was disconnected from the games console, meaning he was controlling the cursor using his brain signals as his arm moved

Countdown to Singularity

Logarithmic Plot

Y-axis: Time to Next Event (Years) — 10^{10}, 10^9, 10^8, 10^7, 10^6, 10^5, 10^4, 10^3, 10^2, 10

X-axis: Time Before Present (Years) — 10^{10}, 10^9, 10^8, 10^7, 10^6, 10^5, 10^4, 10^3, 10^2, 10

Data point labels:
- Life
- Eukaryotic cells, multicellular organisms
- Cambrian explosion (body plans)
- Reptiles
- Class Mammalia
- Primates
- Superfamily Hominoidea
- Family Hominidae
- Human ancestors walk upright
- Genus Homo, Homo erectus, specialized stone tools
- Spoken language
- Homo sapiens
- Homo sapiens sapiens
- Art, early cities
- Agriculture
- Writing, wheel
- City-states
- Printing, experimental method
- Industrial revolution
- Telephone, electricity, radio
- Computer
- Personal computer

2045 A.D
HUMAN/MACHINE CIVILIZATION

1960 - 2050

■ Power shift from west to east

ASIA RISING, U.S. AND EUROPE FALLING
Top 10 nations by GDP, in rank order
■ North America □ Europe ■ Asia ■ South America
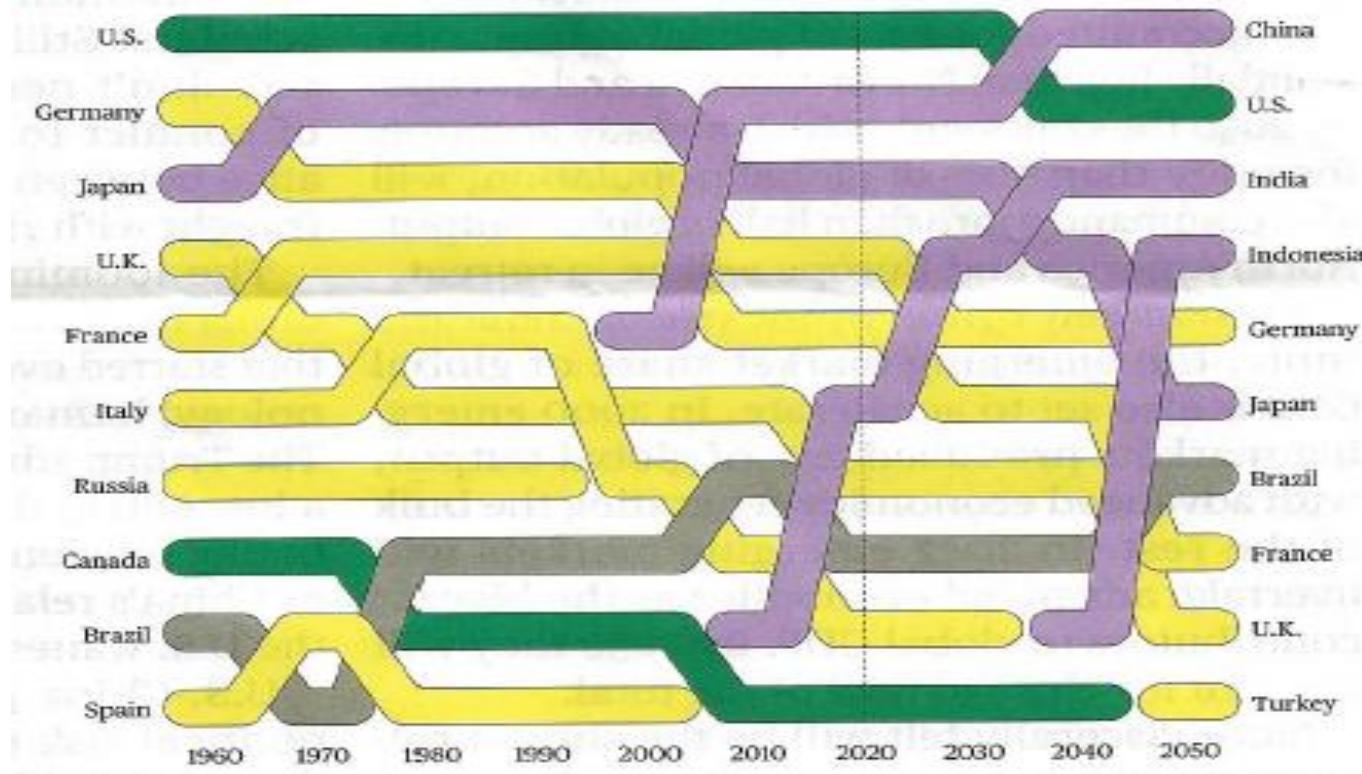
2020 – 2050

- According to Bloomberg projections:
  - The world is in the midst of a messy transition as the balance of both economic and political power shifts from west to east
  - From free markets to the state
  - From centrist democracies to extremes of authoritarianism and populism

GDP shares and forecasts, by type of economy*

- Free and mostly free
- Moderately free
- Mostly unfree

100%

50

0

1951   2020   2050
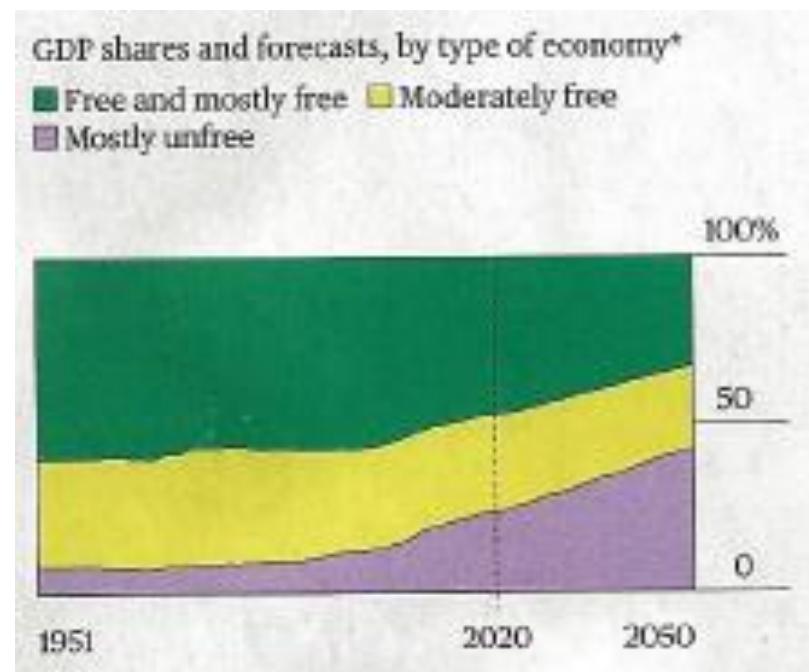
Summary

- Recent trends in software and service distribution include pull technology, push technology, and ASPs
- VR technology has added the third dimension, so users can interact with objects in a way not possible before
- RFID devices and beyond are moving beyond retail
- QR codes have grown in popularity as a marketing tool
- Recent trends in networking technologies include wireless technologies, grid computing, WiMAX, and cloud computing
- Nanotechnology is currently too expensive to justify in many applications
- A blockchain is a decentralized and distributed network Used to record transactions across connected devices
- The world's economic and political power is continuing to shift from east to west, and from free economies to other forms of rule

Ready for that final presentation ?

MIS Overall Design

Vision → Mission

Mission ↔ Ethics Security

Mission → Products Services

Products Services → Processes

Processes → Information

Information → MIS DSS E-Comm

MIS DSS E-Comm → Website

MIS DSS E-Comm → IT Strategy

Website → IT Strategy

Business

supports (drives) — (drives) supports

Organizational ← supports → **Information**
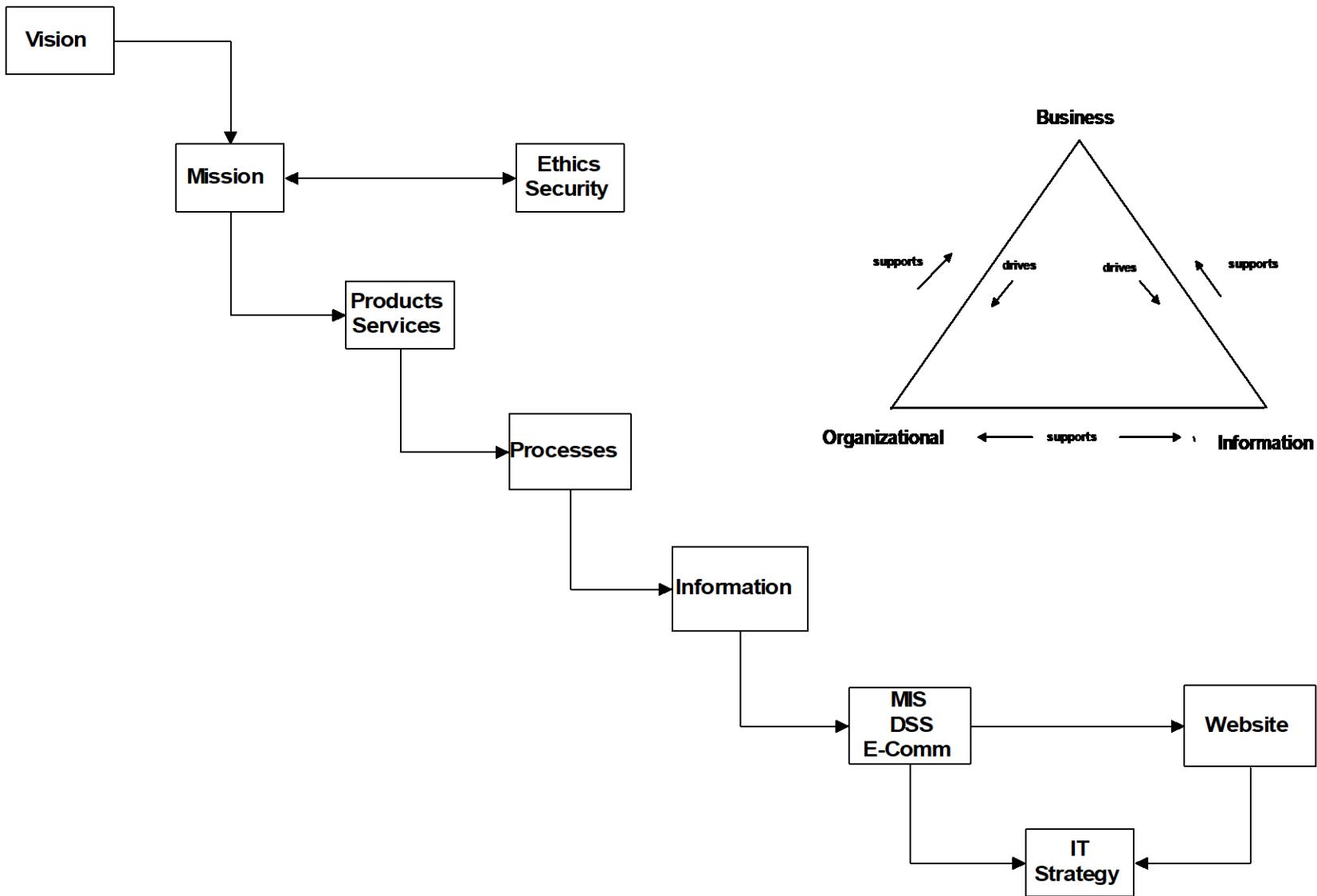
Final Team Presentation

- Complete a PowerPoint presentation containing some your key project deliverables as shown on the next slide
- Time limit → xxxxx
- Remember that you are competing with the other teams

Team Project Deliverables

[recommend items in red in presentation, include all in final ppt file]

- Report 1
  - Selection of Industry Area
  - Mission and Vision Statements
  - Specification of Product(s) and/or Service(s)
- Report 2
  - Critical Success Factors
  - Competitive Analysis
  - **Strategic Use of Information Technology**
- Report 3
  - Key Process Definitions (main scenarios)
  - Information Needs (Entity [Table] Specification)
  - Ethics, Privacy, and Security Issues
- Report 4
  - E-Commerce Design & Planning questions
  - Web Site Design
- Report 5
  - Wireless Considerations (use of mobile technology)
  - Acquisition, Outsourcing, and Integration Strategy
  - MIS Specification – TPS & Organizational Information Systems
- Report 6 – Final Report
  - Decision Support
  - Database Prototype (Access)
  - Web Prototype
  - Final Summary
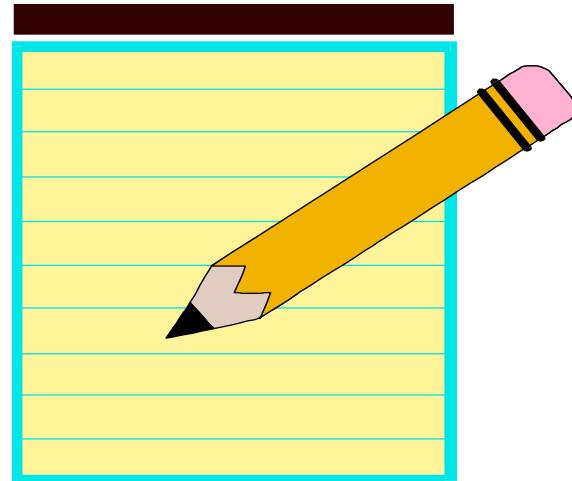
Final Team Presentation

- Maximum of XX minutes of class presentation time for traditional classes
- Suggest including the items in red on the previous slide
- Focus on those components that you feel best represent your MIS
  - Description of business
  - Strategic use of IT
  - Web site design
  - …
- Competition between teams
  - Forced ranking (see evaluation form)

Possible Presentation Issues
(traditional in person class)

- Not introducing team and project
- All team members do not participate
- Sloppy or inappropriate dress
- Reading directly from slides
- "ums"
- Slang, vulgarity, or inappropriate remarks
- Not speaking loud enough
- Font on slides is to small
- Not enough contrast between background and foreground
- Not being enthusiastic
- Not answering questions accurately or completely
- Not making points clearly
- Not enough graphics or multimedia
- Too much graphics and multimedia
- Missing slide titles
- Missing citations and/or references
- Not concluding presentation cleanly
- Not forwarding the slides to the instructor

Evaluation Form

- Complete the evaluation form shown in the following slide
  - Download the form (see next slide), fill it out, and then submit the complete form in Canvas

Project Evaluation Sheet

MIS 231 Project Evaluation
(you must complete and turn in this sheet to get a grade in this course)

Project: _____

Name: _____

Self Evaluation (A to F): _____

Comments: _____

Grade Definitions: A=Exceeds Goals, B=Meets All Goals, C=Meets Most Goals, D=Meets Some Goals, F=Meets Few Goals

My Teammate Grades

Person	Grade (A to F)	Comments

Other Team Evaluation
(forced ranking, no ties)

Team	Rating (1 = best, 2=second, ...; no ties)

References

- The Presentation Secrets of Steve Jobs: How to Be Insanely Great in Front of Any Audience by Carmine Gallo

- Information Technology Jobs in America: Corporate & Government Career Guide (Information Technology Jobs in America: Corporate & Government) by Info Tech Employment and Partnerships for Community

- How'd You Score That Gig?: A Guide to the Coolest Jobs-and How to Get Them by Alexandra Levit

- Guerrilla Marketing for Job Hunters 2.0: 1,001 Unconventional Tips, Tricks and Tactics for Landing Your Dream Job by Jay Conrad Levinson, David E. Perry, and Darren Hardy

- Get The Job You Want, Even When No One's Hiring: Take Charge of Your Career, Find a Job You Love, and Earn What You Deserve by Ford R. Myers

Homework

- Textbook Chapter 14
- Quiz on this lesson and textbook Chapter 14
- Reminders →
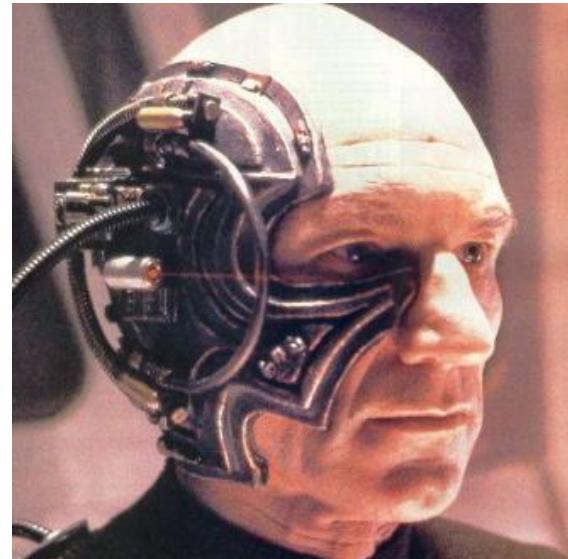
Reminders

- **Email in your individual IT presentation (in PowerPoint)**

- **Complete Canvas quizzes**

- **Email all ABC case study assignments →**

- **Make sure team presentation has been uploaded to Canvas (including all team deliverables, not just those presented)**

ABC Case Study Assignments
(lesson #)

- Mission, Vision, Product/services description (#1)
- Strategic use of IT and CSF's (#3)
- Processes, database tables, and CRUD (#4)
- Ethical, privacy, security issues and solutions (#5)
- E-commerce: web design and planning questions (#8)
- Use of mobile technology (#9)
- Software acquisition methods (#10)
- Enterprise systems TPS, MIS, ERP) (#11)
- Decision support needs and systems (#12)
- Full Access model (#12)
- Intelligent systems (#13)
- Prototype web pages (#13)

Your Future and Career(s)

Your Future and Career(s)

- **Pick something:**
  - You like to do
  - You're good at
  - Think globally
  - For which there is high future growth
- **You are living in exponential times:**
  - Web 2 and other IT innovations will redefine business
  - There will be a constant need for re-education
  - <u>More work will be outsourced to developing countries</u>
  - <u>More work will be replaced by IT systems and robots</u>

IT – Where the Money is in the 21st Century

MONEY SPENT ON SOFTWARE, DATA, STORAGE, AND OTHER FUNCTIONS DELIVERED VIA THE INTERNET

FORECAST

$150 billion
$120 billion
$90 billion
$60 billion
$30 billion

'08 '09 '10 '11 '12 '13 '14 '15 '16 '17 '18 '19 '20

This is Huge !

We are living in exponential times
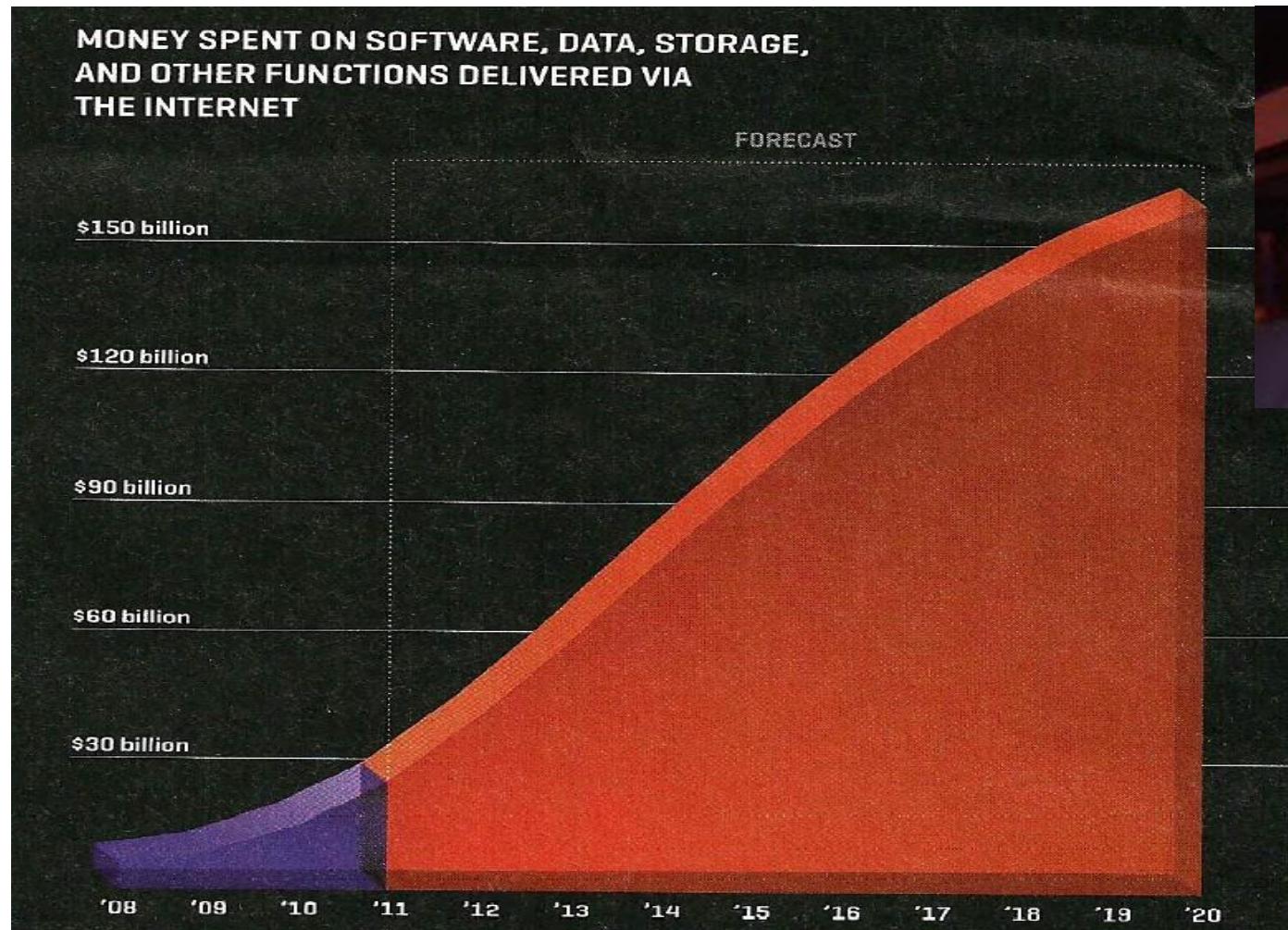
Best of the best US jobs are tech and tech again

SAN FRANCISCO Hey kids, want to grow up to land the best job in the country? Then keep poring over those math and science textbooks.

Jobs that require a range of STEM skills (science, technology, engineering and math) claimed 14 spots in Glassdoor's new "50 Best Jobs in America" survey, out Monday.

This includes the top-seeded position: data scientist, a job in which you employ considerable math and computer programming skills to wrestle huge amounts of raw data into intelligible and useful data sets.

That job took the crown with a Glassdoor score that reflected the number of openings (currently 4,184), company satisfaction rating (reflective of culture and values) and a healthy median base salary ($110,000).

In fact, four of the top five jobs in the survey were for tech workers, including DevOps engineer (No. 2; 2,725 openings; $110,000), data engineer (No. 3; 2,599 openings; $106,000) and analytics manager (No. 5; 1,958 openings; $112,000). In fourth position was tax manager.

The most lucrative tech job was solutions architect, with a base salary of $125,000.

Half of the high-paying jobs in America now require this skill

By Catey Hill in MarketWatch [www.marketwatch.com]

Published: Aug 29, 2016 9:30 a.m. ET

Roughly half of the jobs in the top income quartile — defined as those paying $57,000 or more per year — are in occupations that commonly require applicants to have at least some computer coding knowledge or skill, according to an analysis of 26 million U.S. online job postings released this month by job market analytics firm Burning Glass and Oracle Academy, the philanthropic arm of Oracle focused on computer science education, in Redwood City, Calif. In simple terms, coders write the instructions that tell computers what to do; in-demand programming languages include SQL, Java, JavaScript, C# and Python.

This high number is thanks, in part, to the fact that it's not just technology jobs that now require at least some coding knowledge, says Alison Derbenwick Miller, the vice president of Oracle Academy. "Computing has become a tool in every industry," which means that coding knowledge is now needed for workers across fields, she says. Indeed, everyone from business people who work with data to designers and marketers who create websites to scientists who conduct research now need at least some coding knowledge.

Employers and employees — even those who aren't in the technology field — say the same. Jake Lane, a growth analyst at lawn care company LawnStarter, says that "having some knowledge of coding is essential for job seekers these days," as it can help them understand the tasks of — and work more effectively with — other departments, including their tech and engineering

JOB GROWTH/LOSS BY INDUSTRY

The measure of industries adding jobs (the "diffusion index") went up, a sign that more companies were growing than shrinking.

Growth:

1. Information services: +7.5%
2. Nonstore retailers: +6.5%
3. Warehousing and storage: +6.2%
4. Computer systems design and related: +5.8%
5. TIE Pipeline transportation: +5.7%
   Misc. nondurable goods manufacturing: +5.7%
6. TIE Sightseeing transport: +5.4%
   Data processing, hosting, and related: +5.4%
7. Motor vehicle and parts manufacturing: +5.3%

Loss:

1. Support activities for mining: −18.3%
2. Coal mining: −9.4%
3. Oil and gas extraction: −7.0%
4. Mining, excluding oil and gas: −5.8%
5. Water transportation: −5.7%
6. Communications equipment manufacturing: −4.8%
7. TIE Primary metals manufacturing: −2.4%
   Machinery manufacturing: −2.4%
   Sporting goods, hobby, book, and music stores: −2.4%

IT's TRUE

- **5 out of 10 fastest growing professions (according to the U.S. Department of Labor) are in IT/MIS**

GlassDoor 2020 Best Jobs

- **1. Front end engineer**
- Job satisfaction rating: 3.9, Number of job openings: 13,122, Median base salary: $105,240
- **2. Java developer**
- Job satisfaction rating: 3.9, Number of job openings: 16,136, Median base salary: $83,589
- **3. Data scientist**
- Job satisfaction rating: 4.0, Number of job openings: 6,542, Median base salary: $107,801
- **4. Product manager**
- Job satisfaction rating: 3.8, Number of job openings: 12,173, Median base salary: $117,713
- **5. Devops engineer**
- Job satisfaction rating: 3.9, Number of job openings: 6,603, Median base salary: $107,310
- **6. Data engineer**
- Job satisfaction rating: 3.9, Number of job openings: 6,941, Median base salary: $102,472
- **7. Software engineer**
- Job satisfaction rating: 3.6, Number of job openings: 50,438, Median base salary: $105,563
- **8. Speech language pathologist**
- Job satisfaction rating: 3.8, Number of job openings: 29,167, Median base salary: $71,867
- **9. Strategy manager**
- Job satisfaction rating: 4.3, Number of job openings: 3,515, Median base salary: $133,067
- **10. Business development manager**
- Job satisfaction rating: 4.0, Number of job openings: 6,560, Median base salary: $78,480

MIS Ranked 2nd in Satisfaction

Satisfaction Not Guaranteed

Percentage of college graduates, sorted by major, who answered 'satisfied' or 'very satisfied' to the question: 'Overall, how satisfied are you with your current career path up to now?'

Major	Percentage
Chemical Engineering	54%
MIS*	54
Accounting	50
Advertising	50
International Business	49
Biology	48
Business	48
Health Care Admin	48
Computer Science	48
Engineering	47
Finance	47
Civil Engineering	46
Other majors	45
History	44
Political Science	44
English	44
Communications	43
Marketing	43
Economics	40
Environmental Engineering	40
Psychology	26
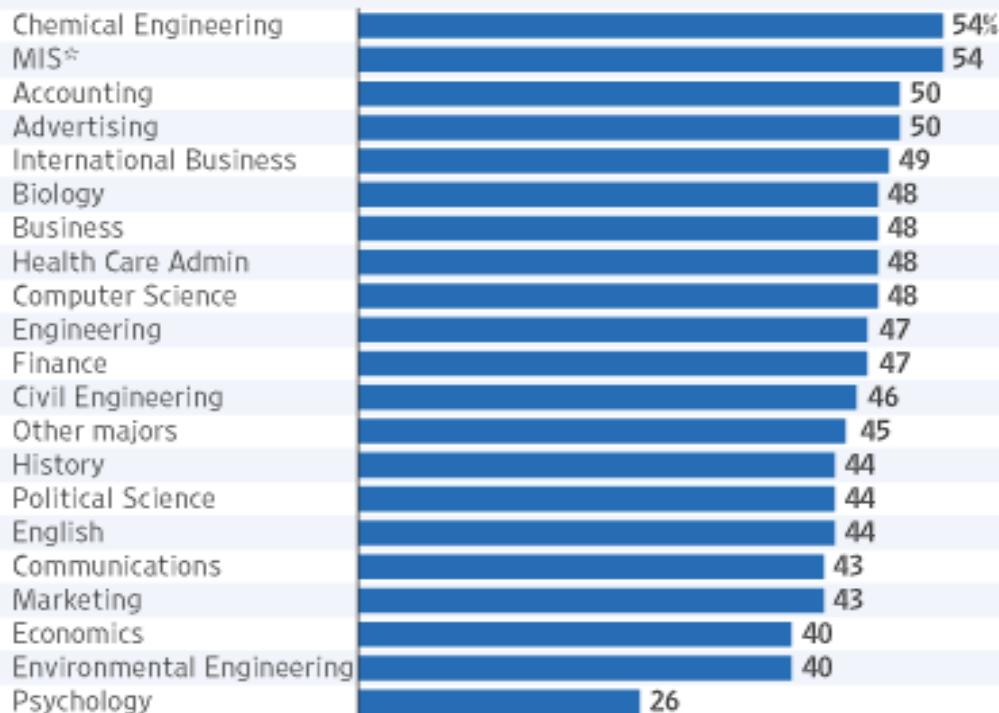
*Management Information Systems

Survey was conducted between April and June 2010, of people who graduated college between 1999 and 2010, with 10,800 respondents. Margin of error ranges between 2% and 7%, depending on major. Survey was limited to grads in a set of jobs deemed satisfying, well-paid and with growth potential.   Source: PayScale.com

Wage Growth

Average annual wage growth

Pay bump
Several major industries are paying more money per hour. The information and financial services sectors have seen the largest pay raise of 4.6 percent.

Total Private
Mining and Logging
Construction
Manufacturing
Trade, Transportation, Utilities
Information
Financial
Education and Health
Leisure and Hospitality

0%   1   2   3   4   5

Source: Bureau of Labor Statistics

Josh Boak; Alex Nieves · AP

Types of Positions for MIS/IT Students

- Business Analyst
- Systems Analyst
- Database Designer/Administrator
- Data Scientist
- Applications Designer, Developer, Programmer
- IT Security Officer
- Webmaster
- Network Administrator
- Social Media Coordinator
- Digital Marketing Coordinator
- IT Consultant
- IT Project Manager
- Ultimately IT Director and CIO!

Student Hiring

Use of Social Networks
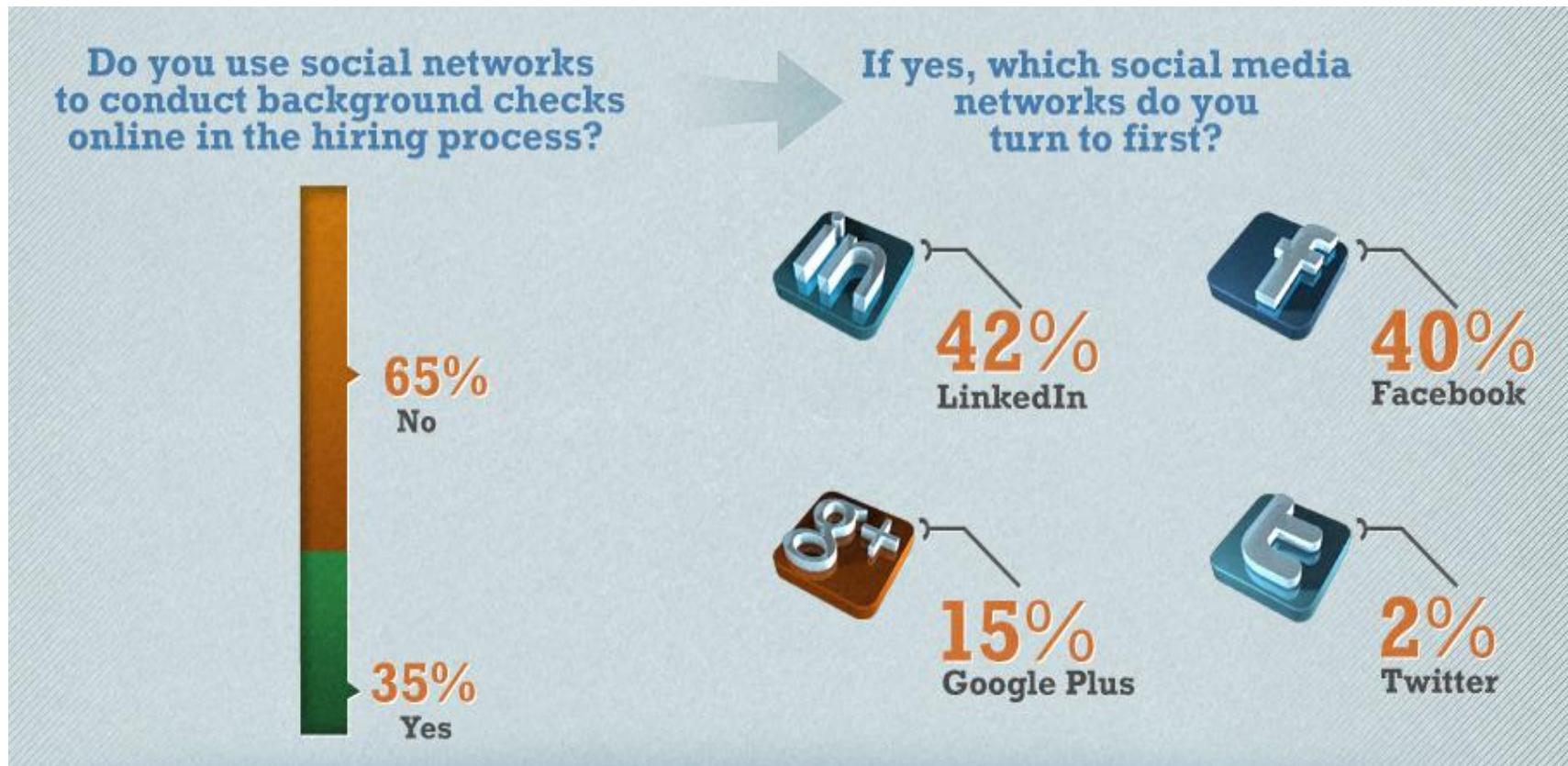
Job Web Sites
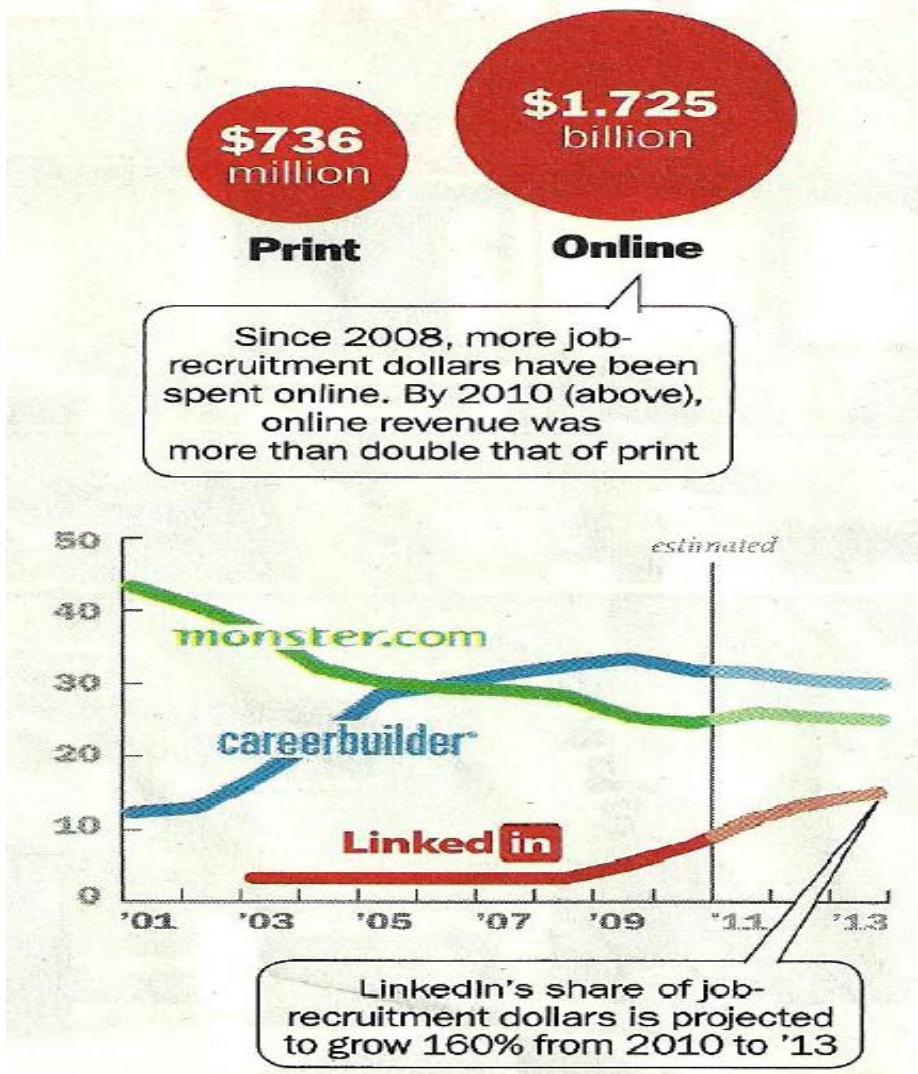
Unique Visitors at Top Job Sites
[Millions - April , 2022]

- **LinkedIn.com – 81.0**
- Indeed.com – 64.2
- Glassdoor.com – 18.9
- ZipRecruiter.com – 15.8
- UsaJobs.gov – 3.4
- Monster.com – 2.8
- SimplyHired.com – 2.6
- CareerBulder.com – 2.2
- Snagajob.com – 2.0
- RobertHalf.com – 1.1

The Kiplinger Letter

FORECASTS FOR EXECUTIVES AND INVESTORS

1100 13th Street NW, Washington, DC 20005 • kiplinger.com • Vol. 93, No. 23

Dear Client:

Washington, June 10, 2016

<u>Lots of fretting about jobs these days</u>... especially given the slowing trend in hiring since Feb., as amplified by the paltry 38,000 jobs added in May, and the many people who've given up looking for work.

<u>Adding to the concerns</u> and overall angst:

<u>The relentless march of automation</u>... robots and other productivity-enhancing machines that will continue to displace people in the workplace.

<u>Folks without skills will take the biggest hit</u>. Coming increases in the minimum wage in many states and cities are sure to advance employers' efforts to automate low-skill jobs...parking lot attendants, order takers, front counter workers and the like.

JOBS <u>But for skilled workers, the future is bright</u>. May's job report is noteworthy for occupations that are not affected by the slowdown in hiring... chiefly tech, accounting, consulting and health care.

<u>In fact, employers find it hard to fill many jobs</u> in fields that require sophisticated technical skills along with an ability to communicate effectively while leading and influencing teams of colleagues.

<u>Successful implementation of technology requires a slew of experts</u> in well-compensated positions, ranging from big data and cybersecurity specialists to software and mobile app developers. Also computer network administrators, systems engineers, programmers of all stripes and wireless network engineers.

<u>Greater use of digitized video for marketing and more is opening up jobs</u> in motion graphics and customer experience design, marketing automation and other specialties that didn't exist a few years ago. Recent college grads and others that specialize in such fields are often seeing multiple offers from top-notch firms.

ECONOMIC FORECASTS

GDP growth
Accelerating in second-half '16;
2% for the year

Interest rates
10-year T-notes at 2.1% by end '16;
30-year mortgages at 3.9%

Inflation
2.4% by end '16,
up from 0.7% at end '15

Unemployment
Ending '16 at 4.7%,
where the rate is now

Crude oil
Trading from $40 to $45/bbl.
by July 4

Disposable income
Rising 2.9% in '16 vs. 3.4% in '15,
after adjusting for inflation

Complete economic outlook at
kiplinger.com/outlooks

13 out of 25 Highest Paid Jobs in 2019 were in IT

HIGHEST PAYING JOBS IN THE U.S.

RANK	JOB TITLE	MEDIAN BASE SALARY
1.	Physician	$193,415
2.	Pharmacy Manager	$144,768
3.	Dentist	$142,478
4.	Pharmacist	$126,438
5.	Enterprise Architect	$122,585
6.	Corporate Counsel	$117,588
7.	Software Engineering Manager	$114,163
8.	Physician Assistant	$113,855
9.	Corporate Controller	$113,368
10.	Software Development Manager	$109,809
11.	Nurse Practitioner	$109,481
12.	Applications Development Manager	$107,735
13.	Solutions Architect	$106,436
14.	Data Architect	$104,840
15.	Plant Manager	$104,817
16.	IT Program Manager	$104,454
17.	Systems Architect	$103,813
18.	UX Manager	$102,489
19.	Site Reliability Engineer	$100,855
20.	Cloud Engineer	$98,626
21.	Attorney	$97,711
22.	Data Scientist	$97,027
23.	Information Security Engineer	$95,786
24.	Analytics Manager	$95,238
25.	Financial Planning & Analysis Manager	$94,874

0   $50K $100K $150K $200K

JOHN DOE

john.marvin.doe@gmail.com   linkedin.com/in/johndoe   321-555-5555

Professional Summary

I am an award-winning circus professional—an expert in circus performance, personnel management and marketing. Despite a shrinking U.S. market, I have consistently increased attendance and revenues through data-driven social media marketing and promotion of my

Skills

- Juggling
- Clowning
- Elephant Hygiene
- Tightrope Walking
- Acrobatics
- Oversized Shoe Repair
- Crying on the Inside

Experience

XYZ Staffing Agency, New York, NY   2020–present
Consultant
- Fostered 15 newly retired elephants at a wildlife preserve after their owner ceased operations
- Developed lifesaving treatment protocol for juvenile elephant with peanut allergy
- Launched Instagram account for elephants that gained 110,000 followers and raised $1.5 million

PQR Brothers Circus, Toledo, OH   2009–2020
Chief Clown & Assistant Lion Tamer
- Won $100,000 grand prize, *America's Got Clowns*, 2017
- Drove, on a regular basis, minivan carrying 51 clowns and 3 poodles
- Achieved 87% success rate in recapturing escaped lions

MNO Neo-Retro Circus, Portland, OR   2006–2009
- Juggled up to 5 chain saws blindfolded while seated on chair balanced on tightrope
- Spun cotton candy at the rate of 1 bushel per minute
- Led 5-person elephant-waste disposal crew

Career Summary

Cirque JKL, Paris, France *Sous-clown, 2001–2006*
GHI Sideshow Industries, Denver, CO *Carnival barker, animal handler,* 1995–2001

Continuing Education/Certifications

First Aid for Circus Animals (Coursera); First Aid for Clowns Working With Circus Animals (LinkedIn); Master Juggler (International Balance Association); Advanced Topics in Elephant Communication (edX)

Education

DEF University Master of Business Administration
ABC College Bachelor of Arts in Theology, Cum Laude

Volunteer Activities

Circus Cheer for Children's Hospitals; ElderClown Entertainment Coalition

MIS

Top 50 Companies by Market Cap (in Q3 2018)

IT Software & Services

f $460B

Adobe $133B

salesforce $119B

accenture $111B

SAP $146B

vmware $63B

DS $38B

$32B

intuit $59B

Microsoft $883B

Cognizant $45B

$29B

Square $40B

Alphabet $839B

servicenow $34B

Infosys $46B

workday $31B

autodesk $33B

Tencent 腾讯 $383B

baidu $77B
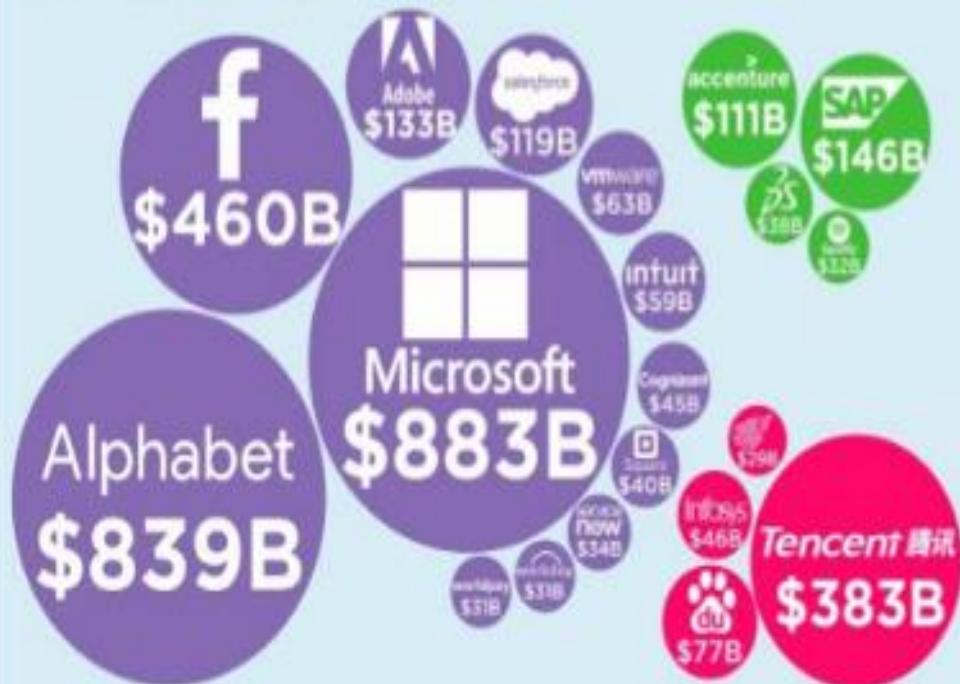
Technology Hardware & Equipment

$1.1T

CISCO $224B

NOKIA $30B

DELL $74B

Hewlett $34B

HP $39B

Corning $29B

mi $42B

KEYENCE $72B

SAMSUNG $297B

Semiconductors

Texas Instruments $34B

intel $222B

nvidia $174B

ASML $80B

Applied Materials $38B

Qualcomm $108B

micron $53B

BROADCOM $103B

tsmc 台积电 $219B

SK hynix $51B

Media

WALT DISNEY PICTURES $175B

COMCAST $164B

Sky $39B

Charter $88B

NETFLIX $164B

NASPERS $91B

Retailing

amazon $962B

Alibaba.com $412B

$28B

$36B

Tech Companies by Region

- Europe
- North America
- Africa
- Asia
- Middle East

Note: Market Cap. as of Oct 2, 2018

Where are IT Jobs
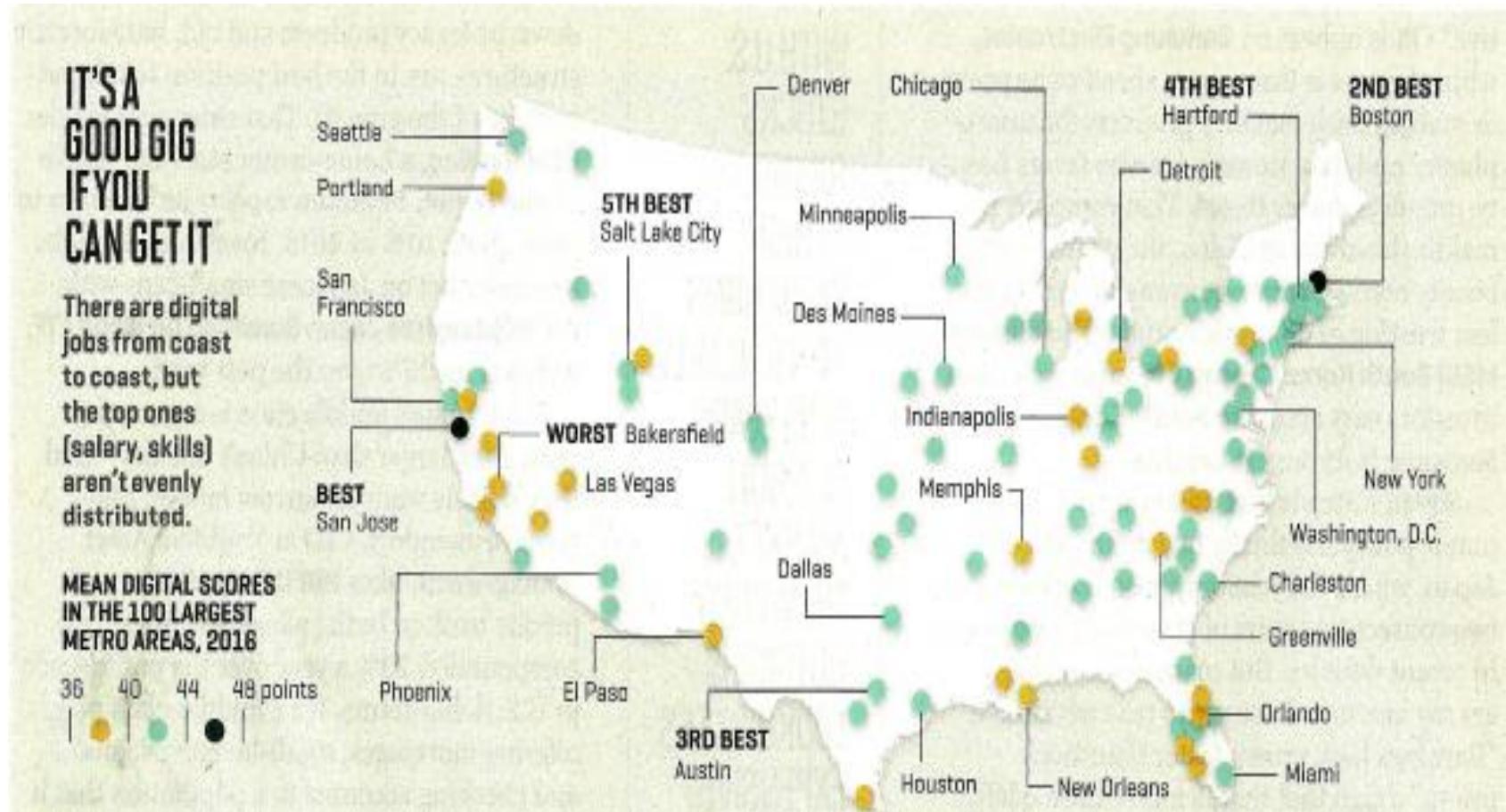
IT Job Families

DevOps-Blockchain - DLT

Level IV
- CXO -Chief Experience Officer
- CDO – Chief Digital Officer
- Digital Brand Manager

Level III
- Manager Blockchain DLT
- Manager DevOps
- Project Manager Blockchain DLT

Level II
- Blockchain DLT Architect
- Blockchain DLT Analyst
- DevOps Application Designer

Level I
- DevOps Software Engineer
- Blockchain DLP Developer
- DevOps Quality Control Specialist
- DevOps Version Control Specialist

Professional Family

Level III
- Project Manager Systems
- Project Manager (EA)

Level II
- Project Manager Deployment
- ERP Team Lead
- ERP Architect
- Supervisor POS

Level I
- Enterprise Architect
- Business Services Analyst
- Programmer Analyst
- Programmer
- IT Planning Analyst

Manager Family

Level III
- CIO – Chief Information Officer

Level II
- Director Business Applications
- Director Systems & Programming
- Director Prod Svc Data Center

Level I
- Manager Application Development
- Manager Data Security
- Manager Database
- Manager Operations Support
- Manager Web Content

IT Support Family

Level III
- Customer Service Supervisor
- BYOD Support Supervisor

Level II
- Help Desk Analyst
- KPI Analyst
- Librarian
- Change Control Analyst

Level I
- PCI-DSS Administrator
- Executive Secretary
- Accounts Payable Clerk
- IT Associate
- Computer Operator

Technical Family

Level III
- Database Administrator
- System Administrator

Level II
- Data Security Administrator
- ERP Security Administrator
- ERP Technical Lead
- Shift Supervisor Operations

Level I
- System Programmer
- Supervisor POS
- Production Control Analyst
- Lead Computer Operator

Here is a list of 11 things that many high school and college graduates did not learn in school.

Rule #1
Life is not fair; get used to it.

Rule #2
The world won't care about your self-esteem. The world will expect you to accomplish something BEFORE you feel good about yourself.

Rule #3
You will NOT make 40 thousand dollars a year right out of high school. You won't be a vice president with a cell phone, until you earn both.

Rule #4
If you think your teacher is tough, wait until you get a boss. He doesn't have tenure.

Rule #5
Flipping burgers is not beneath your dignity. Your grandparents had a different word for burger flipping; they called it opportunity.

Rule #6
If you mess up, it's not your parents' fault, so don't whine about your mistakes, learn from them.

Rule #7
Before you were born, your parents weren't as boring as they are now. They got that way from paying your bills, cleaning your clothes, and listening to you talk about how cool you are. So before you save the rainforest from the parasites of your parents' generation, try "delousing" the closet in your own room.

Rule #8
Your school may have done away with winners and losers, but life has not. In some schools they have abolished failing grades; they'll give you as many times as you want to get the right answer. This doesn't bear the slightest resemblance to ANYTHING in real life.

Rule #9
Life is not divided into semesters. You don't get summers off and very few employers are interested in helping you find yourself. Do that on your own time.

Rule #10
Television is NOT real life. In real life, people actually have to leave the coffee shop and go to jobs.

Rule #11
Be nice to nerds. Chances are you'll end up working for one.

Excerpted from "Dumbing Down Our Kids: Why American Children Feel Good About Themselves But Can't Read, Write or Add" by Charles J. Sykes.

There's a storm coming…

Time Magazine 2011

Examples of Final Team Presentations

Front Page Shots

Mission Statement

Front Page Shots (FPS) will be a stable, profitable, and reputable resource in the mid-south news industry.

FPS will attain peak efficiency by focusing on a few services: contracted photography, individual events, and individual photos.

FPS expects to grow substantially in the next five years by building a reputation for providing the fastest and highest-quality services.

Vision Statement

In the near future, we desire to be the go-to name for news photography in the mid-south. We will be known in the industry for having the most vivid and dramatic shots of the events the public cares most about.
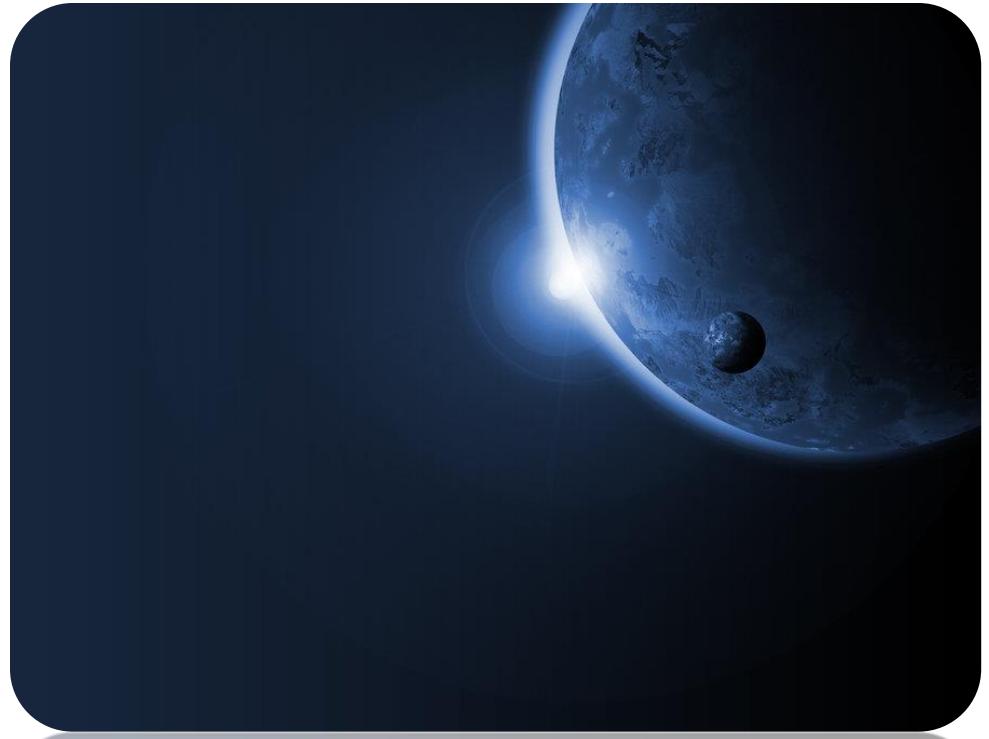
Specification of Product/Services

Elvis Presley Sculpture in Memphis, Tennessee
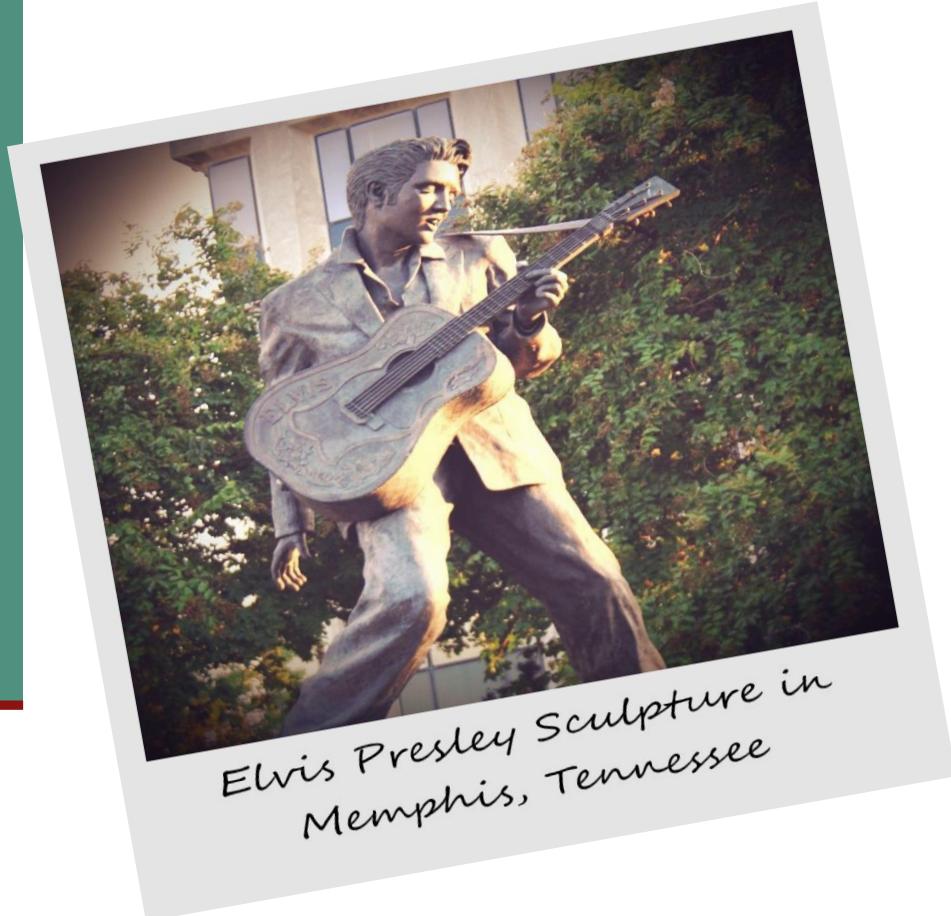
Front Page Shots (FPS) offers photography services for news outlets. FPS offers these services in a couple of ways:

- **On Contract**
  A news organization may hire FPS to shoot events on a regular basis and make the photos available immediately.

- **By Individual Photo**
  An organization may also browse the FPS website by event and purchase a license to use any individual photo they choose.

Critical Success Factors (CSF)

The individual necessities for FPS to be successful consist of:

- Having a reputation for providing the highest-quality photos and fastest service.

- Maintaining loyalty by providing very personal service.

- Using Social Media to reach new customers.

- Building a team of photographers who know the photography trade as well as related legal issues.

Success.

Strategies for Competitive Advantage

FPS must take advantage of information technology and our tight niche to provide faster, more consistent services than the competition.

For example, social media can be used to help photographers reach events before larger organizations can.

Also, a sophisticated website will allow customers to access and purchase photos quickly.

Finally, photographers who specialize in news photography will take the best photos and know the boundaries of the law.

Strategic Use of IT

FPS will use IT to…

Be first on the scene of an event

- FPS will use social media and website tips to learn about news events quickly.
- Employees will be equipped with GPS devices to get to the scene quickly.

Provide fast and easy access to photos

- Contractors will be able to access photos via the website almost immediately after they are taken in the field.
- Other news organizations will be able to view photos and buy usage licenses on the website.

All website functions will also be available via FPS's mobile apps.

Ethics

- All potential employees will be background-checked
- Employees will be trained or must already be knowledgeable in legal issues relating to news photography
- Photography will focus on non-trivial subjects (i.e. no paparazzi shots)

Privacy

- Photo database will be encrypted with industry-standard encryption
- All photos will be transferred from memory cards daily, and cards securely wiped
- All customer information will be confidential and secure
- Future goal: Find technology for full memory card encryption

Security

- Customer web accounts will be secured with strong password enforcement and HTTPS
- A strict digital access hierarchy will be enforced within the company
- The local area network will be strongly firewalled
- Periodical security audits will be made by a third party with results published to reassure customers
- All photo transactions with customers will be made via encrypted email

Database Entities

The Front Page Shots central database will contain five entities:

- Customers
- Contracts
- Events
- Photos
- Photographers

Processes

- **Customers** are added when new contract is signed with a news organization or when an organization buys rights to an individual photo for the first time.

- **Events** are created and updated when photographs are taken of some news event. New photos may be associated to the event if the event occurs over several days.

- **Individual photos** are stored with detailed information such as photographer, location, associated event, etc.

- Finally, **photographers** are added and removed as they join and leave the company. Photographers are associated to their photos so they may be rewarded for especially good photography.

- These **entities** have complex relationships which will be maintained with a sophisticated database.

Web Site Planning

How will you communicate your brand?
Mostly by word of mouth within the media industry, but also by newspaper and radio(?) advertising.
What content will make this site unique and attractive?
Interesting photos of news events will attract the general public. A section for news organizations to purchase photos will attract paying customers.
What will keep visitors coming back?
The site will be regularly updated, which will maintain interest. A thoughtfully designed layout will make the site easy and pleasant to use.
What sort of interactive content does this site need?
The website will be tightly integrated with social media (Twitter, Facebook, etc.) to allow users to share interesting content. There will also be a way for the public to submit news events which may merit photographing.
Should this site include some sort of entertainment to keep people interested?
There will be a section for Funny Photos and the Photo of the Day. There will also be an applet to edit captions into popular photos and share them via social media.
**Should a "community" be built through message boards, memberships, chat areas, and special
interest areas?**
Yes, since the visitors will have a common interest in local news and photography.

Web Site Planning (con't)

What multimedia components might facilitate meeting our objectives?
There will of course be many photos, so the software to manage and display photos must be well-designed. Other multimedia content will be minimal.

Should the site include a help section that allows users to provide feedback and contact the organization?
Yes. The customers should feel their thought and concerns are always heard, so the website should allow open communication.

Should the site include product pictures and descriptions?
Absolutely, and plenty of them!

Should the site include descriptions of services, fees, and related information?
Yes. FPS maintains a profit by keeping and attracting paying customers, so potential customers must be able to find clear pricing and service information easily.

Will the site require the use of forms?
Yes! Forms will be included with social media, community, entertainment, and feedback sections of the site.

Will the site need to be tied to a database?
Yes. With many photos and customer-submitted content, a sophisticated database will be necessary.

Should external links be included?
Links to local news stories and to customers' websites will be included.

Web Design
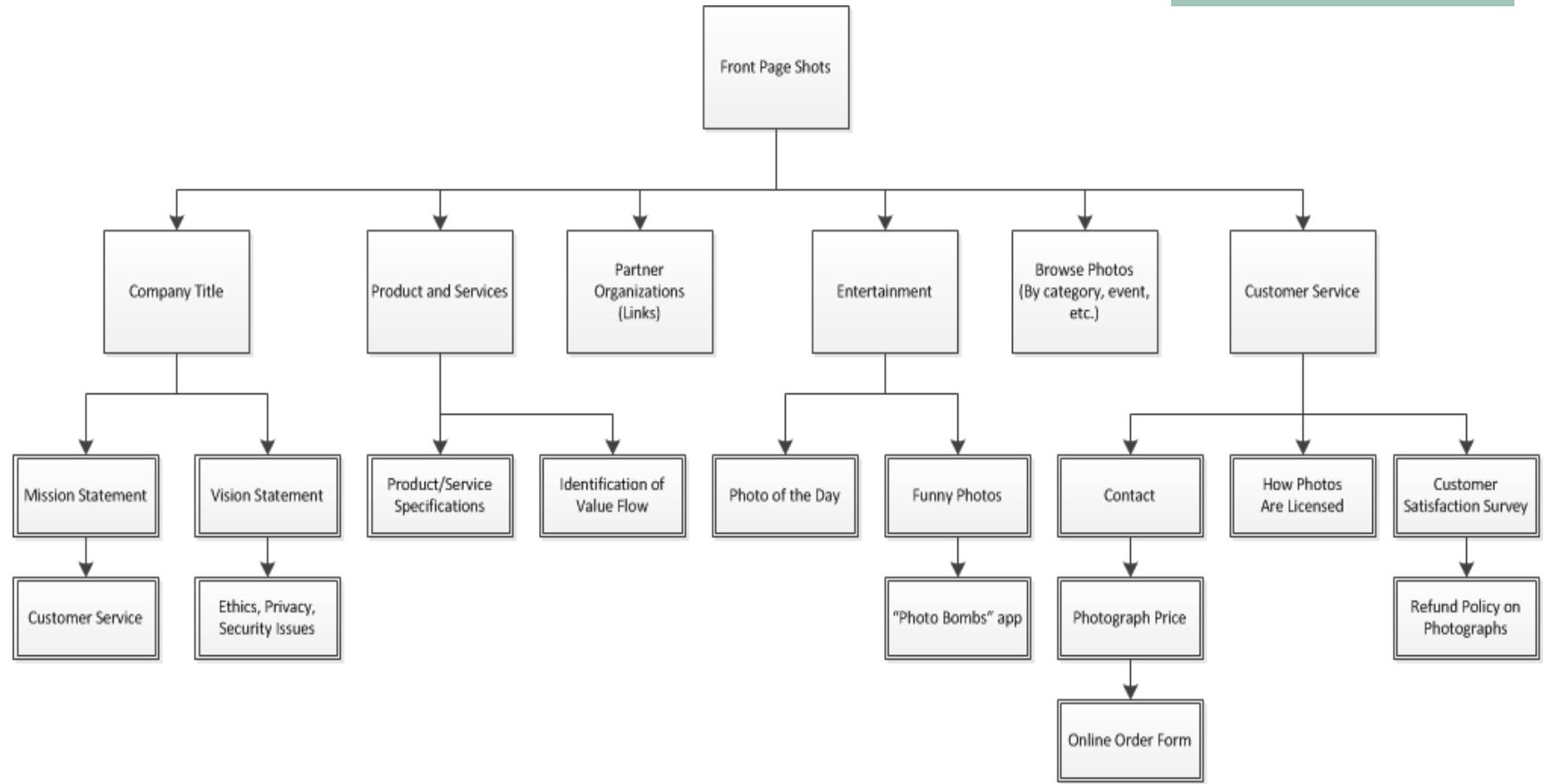
Use of Mobile Computing

- Free Public Mobile App
  - View Daily/Funny Photos, News Stories, etc.
  - Access to Web Community, Social Media
  - Use of "Photo Bomb" App
- Customers' App
  - Quickly View and Buy Photos
- Employees' App
  - Securely Send Photos from the Field to Home Office with GPS Data
- All apps will be available for Apple and Android!

TPS Specification - Payments

Payment Sources:
- Online (Credit)
- Via the FPS Customers' App (Credit)
- Via Office
  - Phone (Credit)
  - Mail (Check, Credit)
  - In Person (Check, Credit, Cash)

All these transactions will be processed through and Online Transaction Processing system (OLTP). Even payments processed in the office will be entered into the same system.

Credit card numbers received by mail, phone, or in person will be stored securely in the customer database for future use.

TPS Specification - Photos

Besides payments, FPS must have a system to handle transactions of goods – in our case, photos.

Transactions:
- Photos From the Field
  - Will be entered online via smartphone, laptop, or in the office. Event, Photographer, and Customer data will be automatically recorded with the photos.
  - Confirmation that the photos are successfully stored in the database will be sent to the photographer.
- Photos Sent to Customers
  - Will be transferred to customer via email or online form.
  - Confirmation of transfer will be entered into the database.
  - Customer may confirm receipt by clicking a link.

MIS Specification

Because FPS processes a lot of data very quickly, management will need bi-weekly reports to survey business data such as

- Income and expenditures
- Contract value
    - Expenses vs. income
    - Marketing value (exposure of photos)
- Photographer performance
    - Number of photos
    - Income from those photos
    - Marketing value from photos
- Website performance
    - Cost of maintenance vs. benefits
    - New Customers
    - Online Payments
    - Event reports from public

All these reports will automatically generated by the database software to reduce the need to create reports manually.

Decision Support

- Will include evaluating the following:
  - Employee performance
    - Profit of their shots
    - Care of their equipment
    - Handling customers
  - Customer services
    - Speed of photo deliveries
    - Resolved and unresolved complaints
  - Website Costs/Benefits
    - Estimated marketing value
    - Cost vs. Benefits of services provided
  - Photography evaluations
    - Quality of the photos

Database Prototype
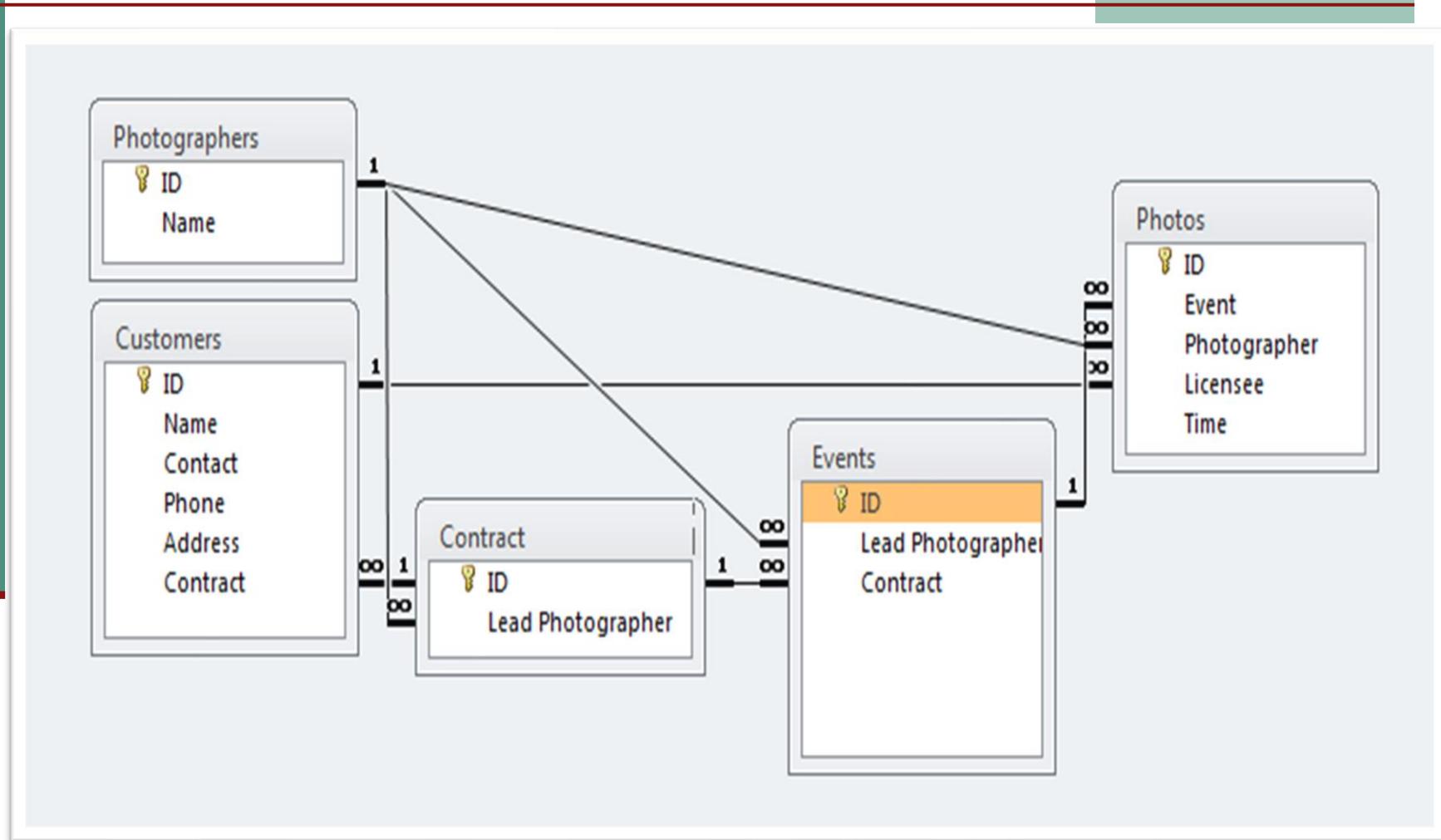
Acquisition, Outsourcing, and Integration Strategy

- Acquisition
  - Buy software to manage the website, mobile apps, and database
- Outsourcing
  - Make agreements with small local photography companies to shoot events far from headquarters.
- Integration Strategy
  - Web hosting and users account control

Web Prototype

Web Prototype (con't)

Web Prototype (con't)

Final Summary

- We plan to be the premiere mid-south news photography company. Our photos are known for being the best available, and our photographers have a reputation for being the first on the scene.

- We use the best website and database software to maintain an efficient photo collection, and mobile computing allows us to get our photos to the media more quickly than our competitors.

- In the end, how we work with our customers is what sets us apart. Open communication through our website makes our customers the most important part of our organization.

901 Southern Kitchen
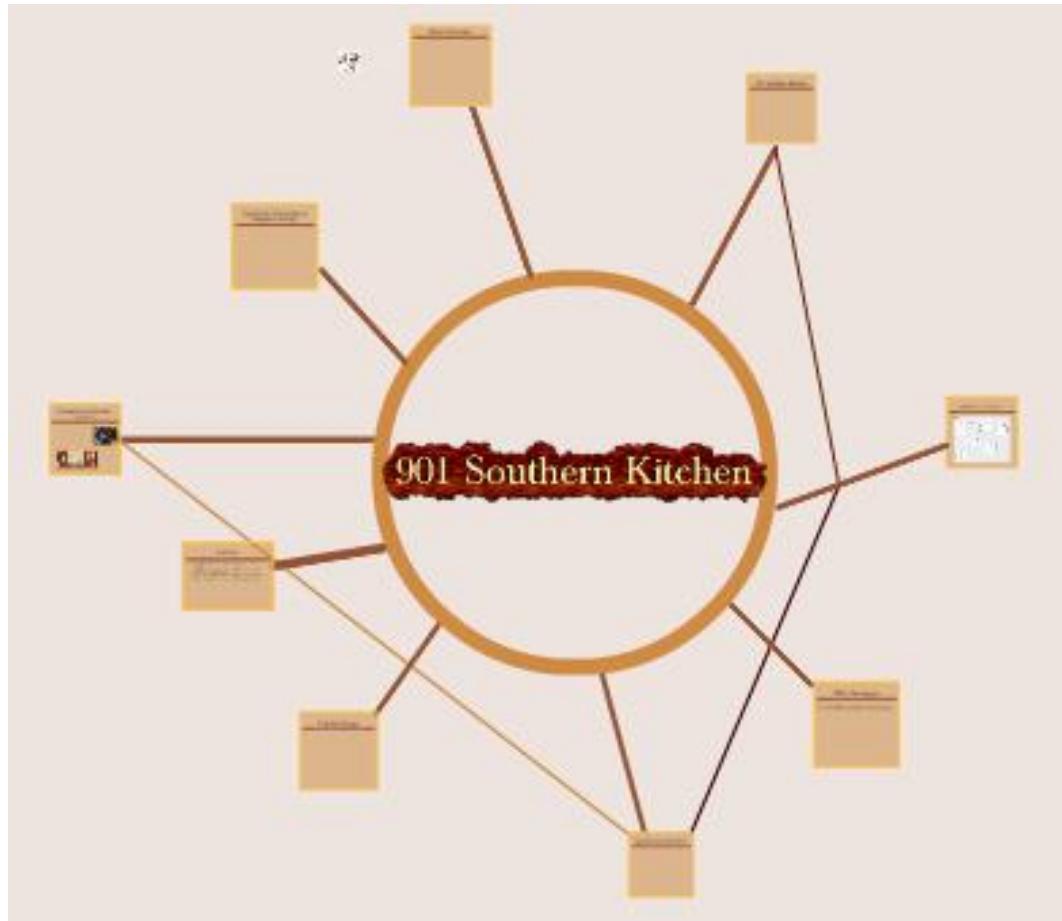
Specification of Product

Product- southern style food/ desserts & various beverages

Service- serving/delivering food & making drinks at the restaurant

Strategic Use of Information Technology

- Walkie-Talkie's
- Tablets (Ziosk) at every table
- Webcam-Enabled Monitoring
- Digital Menu Board

Web Site Design

Database Prototype
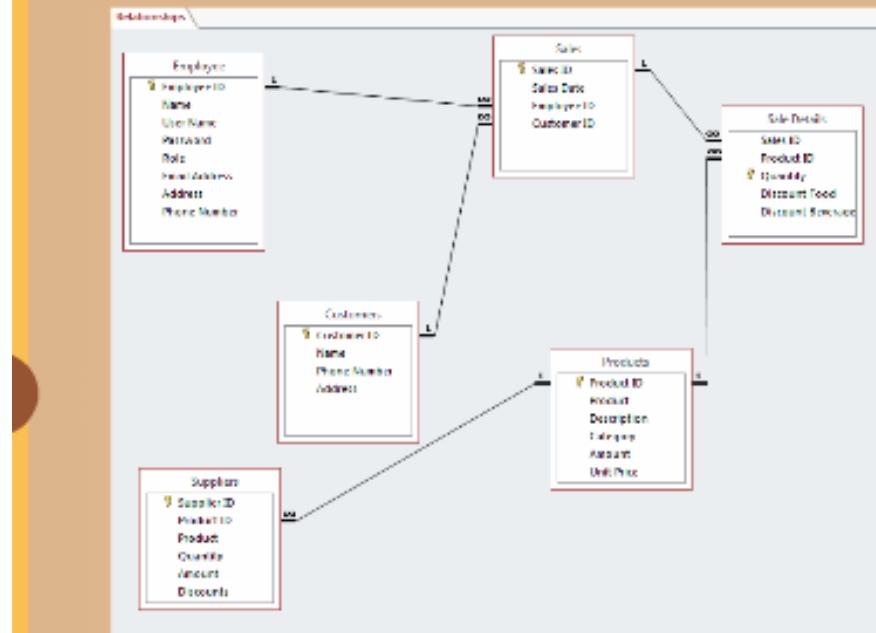
Acquisition, Outsourcing, & Integration Strategy

- Acquisition: Buy software to manage the website, mobile apps, and database
  - Applications necessary for this company include the software for ordering, the table kiosks for customers, and credit car software for keeping up with purchasing. Other software necessary for this company includes the website software where customers can place online orders, look at menus, and find additional information.
- Outsourcing:
  - In order to keep the business running smoothly, some outside IT services will be required. Photographers and web design services will be necessary to market the food properly online. Outsourcing is required so that 901 Southern Kitchen can put focus on the quality of the food and services provided and leave IT issues to the professionals.
- Integration Strategy:
  - Users who order online will create profiles so that information on what they've ordered and purchased can be stored and used for later purchasing. This information will be secure and remain private to 901 Southern Kitchen.

APPETIZERS

BBQ Nachos	$6
Sausage and Cheese Plate	$10
Fried Pickles	$6
Hush Puppies	$5
Fried Green Tomato Sliders	$7
Bacon Wrapped Stuffed Peppers	$7

PLATES

Final Summary

Our restaurant, 901 Southern Kitchen does not only guarantee a high quality service for food and beverages, but it is also empowered by various resources in the IT world. As a business, we have acquired multiple forms of technology that will help us keep up with our mission statement in an effective way while helping our daily operations. Furthermore, we can ensure the satisfaction and safety (both physical and virtual) of our customers.

Following the traditions of southern cuisine, our restaurant currently holds one of the best kitchens and staff in the whole south, which offer food of the highest quality. The 901 Southern Kitchen can be easily found through our web page or by any traveling mobile app, or just by simply visiting our venue. Our restaurant will not only give employment opportunities to individuals in different fields of study, but will also give our customers the privilege of enjoying dozens of traditional dishes. This will all simultaneously help Memphis and the whole south by keeping our traditions and maintaining a high standard of quality.

We are excited about this restaurant and the positive impact it will bring to the community. We hope that our customers can enjoy the food we offer and learn about multiple traditions from the south.

Monorail Memphis

Monorail Memphis

- CONNECTING THE CITY IN AN AERODYNAMIC MANNER

Vision Statement

❏ At Monorail Memphis, we are striving to become the foremost leader in safe and reliable transit, while additionally introducing a more aerodynamic modern transportation system, in the city of Memphis.

❏ This will help connect our blooming City, as it takes the next steps into a major metropolitan area and visitor sight

Mission Statement

❏ The Monorail Memphis system will bypass traffic and congestion while ensuring safe travel to and from Memphis' most popular sites.

❏ We utilize a digital ticketing system accessible from mobile devices, as well as traditional paying methods to reduce boarding time and offer a seamless travel experience.

❏ Additional logistic systems will add efficiency to the service while keeping our travelers notified of monorail locations.

Service Specification

❏ Our Monorail is set to offer transportation for both residents and visitors to and from the Greater Memphis Metropolitan area.

❏ These sites include, but are not limited to, the Memphis International Airport, Beale St., The Bass Pro Shops at the Pyramid, The Orpheum Theatre, Autozone Park, FedEx Forum, Overton Square, Liberty Bowl Stadium, Theatre Memphis and the Oak Court Mall.

❏ Running along, but not limited to, Riverside Blvd, Madison Ave, Poplar Ave, and Airways Blvd.

Critical Success Factors (CSF's)

Growth:

- ❏ Entering a new market, we need to acquire new consumers
- ❏ We also have a vision to where our organization will be in the Future

Quality:

- ❏ We want to offer the highest quality product available in Memphis in regards to public transportation

Product/Service Development:

- ❏ With Monorail Memphis being a completely new organization in Memphis, we have to constantly evolve and adapt to our new consumers needs to make a name for ourselves.

Customer Satisfaction:

- ❏ How Happy are customers and what will we do to keep them happy?
  - ❏ Security
  - ❏ Comfortable Seats (plenty of space as well)
  - ❏ Payment Methods
  - ❏ Popular/Convenient Pickup and Drop-Off locations

Competitive Advantage Analysis

Competitive Advantage Analysis:

- ❏ **Cost:** The Memphis Monorails will be set at an $8 per ticket price, Which is easily affordable and will attract many people to use the system, while being cost efficient as well as allow the Monorail Memphis system to make a profit.
- ❏ **Quality:** As far as quality goes, They (the monorails) speak for themselves as a much quicker and safer way to get from point A to point B, in the areas offered through the monorails. No other system in Memphis offers any kind of similar system throughout the most attractive and populated areas in and around the city.

- ❏ **Speed:** The fastest way to travel from one location to the next on ground has come to be through trains, or any form/method that derives from it, (ex: metro systems, monorails, passenger trains, trolleys) as they avoid stoplights (with the exception of trolleys) and travel at higher speeds than road speed limits allow. Our monorail would be the quickest possible way to travel in the emerging competitive city of Memphis, as there is no other form of metro system or train system offered to passengers.
- ❏ **To Conclude**, this can ultimately be translated as a monopolistic-style system, though not enforced or completely necessary, and would mean that the company would harvest vast profits and expand quickly to cover more ground.

Strategic Use of IT

❏ Monorail Memphis will use IT to manage our website, mobile applications, and logistics. Providing customers with a fluid user interface on our mobile applications will increase customer satisfaction while keeping customer financial information on file, encouraging the renewal of yearly ticketing subscriptions. Our logistics will be managed through a digital interface that will be available for employees with more limited functionality to customers in order to provide knowledge regarding monorail locations and statuses.

Ethics

❏ Encourage honest and morally correct conduct practices, including fair dealing and the morally correct handling of conflicts of interest

❏ Encourage full, fair, accurate, timely and understandable disclosure among the complete organization of Monorail Memphis

❏ Encourage complete compliance amongst all applicable laws and governmental rules and regulations which apply to Monorail Memphis

❏ Ensure the protection of Monorail Memphis' confidential information that involves but is not limited to employee information and customer account information

❏ Encourage wrongdoing in all circumstances involving Monorail Memphis and its' business practices

Privacy

❏ Monorail Memphis will ensure that customer data is secure and only used to carry out transactions

❏ Our network and database will be fortified with an advanced firewall and an Intrusion Prevention and Intrusion Detection System

❏ All data will be encrypted through trusted encryption technologies (SSL)

❏ Surveillance cameras will only be used to promote a safe travel environment

❏ Surveillance will be monitored solely by our trusted security staff

❏ It is our guarantee that no customer information will be leaked or stolen from our secure database

Security

❏ It is our goal to make the monorails as safe and easy to ride as Possible, which includes caring for the comfort and Safety of our passengers

❏ Monorail Memphis will begin with two onboard security guards (with a vision on requesting more if necessary) per monorail to handle any misconduct, misunderstandings, or disagreements between passengers.

❏ These guards are also responsible for taking action in case of an emergency or severe situation.

❏ Weapons will be prohibited (with the exception of licensed guards) and measures will be taken for those who violate it.

❏ Guards will be trained to especially deal with circumstances involving terrorism and/or armed and dangerous individuals.

❏ In an emergency, the monorail will automatically stop and alert the MPD and Fire Department.

Processes
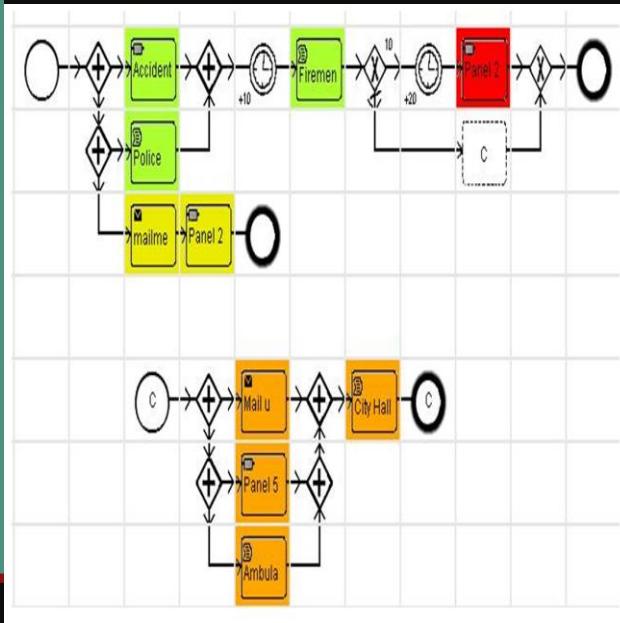
One of the goals of a smart city is to integrate operations across all of a city's "silos" or verticals within the organization.
A key element in achieving this goal is technology that supports a common view of city systems, from transportation to utilities to public services and security.
Where relevant, this technology may involve sensors and communications, integrating systems, and supporting analytics and intelligence that create situational awareness.

In the transportation arena, process management basics typically include cameras, traffic sensors, dynamic messages signs, and smart traffic signal controllers – all managed from a transportation management center (TMC).
Predetermined or automatically generated traffic incident response plans add a higher level of intelligence to TMC operations.
An emerging technology is the use of decision support systems that provide guidance on the selection of the most appropriate response strategy in complex situations.

Access Partial Model
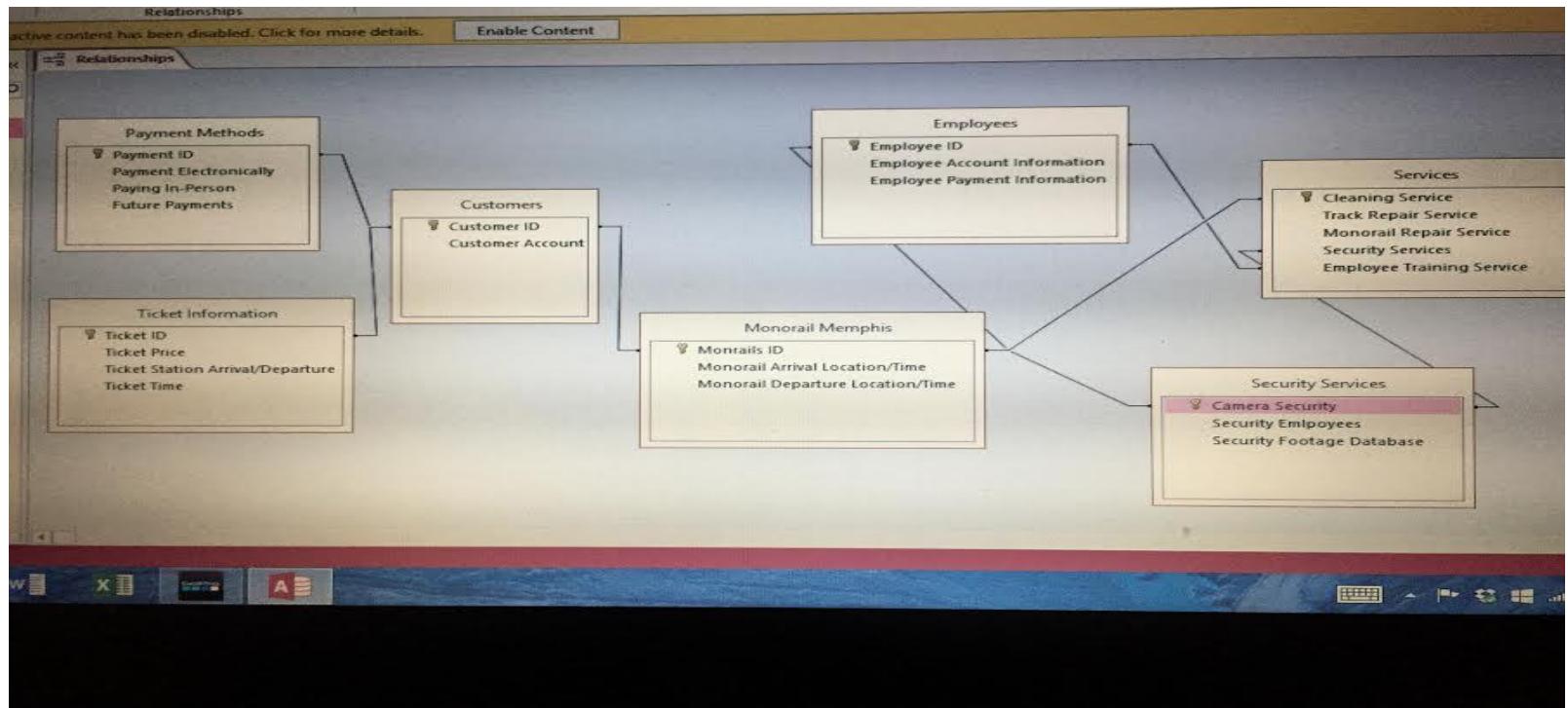
Website Design
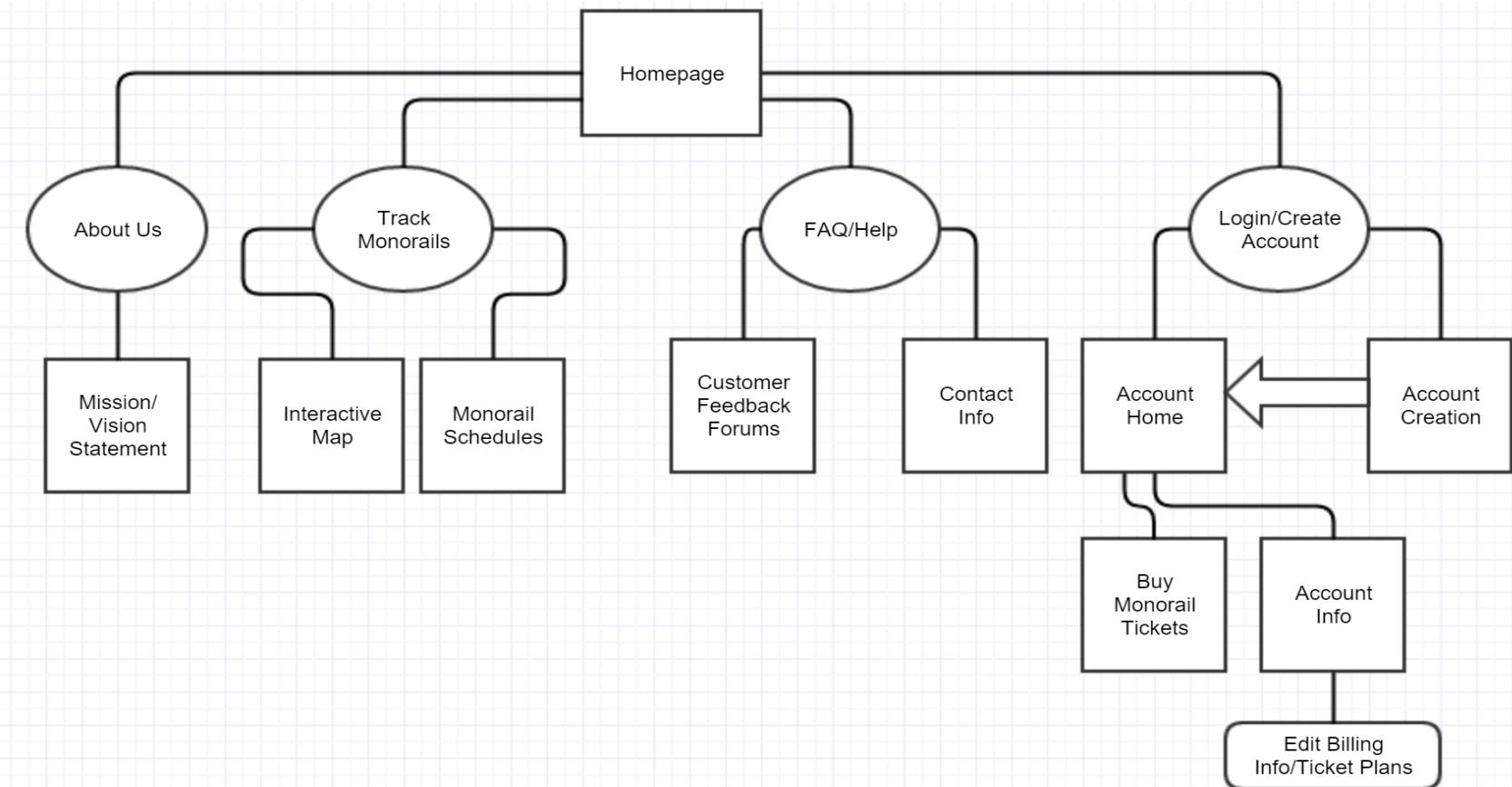
Mobile Computing

❏ Our company believes the Monorail system will best work by implementing mobile devices and applications for the use of our employees and customers, in order to fully take advantage of the technology and high-speed communication systems available to us.

❏ With security risks at stake however, we believe it to be best for Monorail Memphis to provide custom iPads that have been pre set-up and tested. we'll be operating on iPads that specifically link all data and info between them and is restricted to work purposes only, and protected from being hacked.

❏ The iPads will be safely stored in the equipment facility before and after use, as well as to have id numbers linking to whoever uses it.

Mobile Computing Cont.

❏ In doing so, we hope to reduce the risk of security threats such as implanting bugs and viruses from the inside or outside onto our systems, while carefully maintaining a controlled environment and the most recent data.

Functional Information Systems (MIS)

❏ Since our Functional Information Systems will be heavily dependent on TPS data, we will use them to

❏ Report routinely on the status and trends of sales

❏ Take note of sales by customer, product (individual ticket or subscriptions)

❏ Provide comparative reports to determine the times of heaviest traffic on the monorails

Monorail Memphis TPS
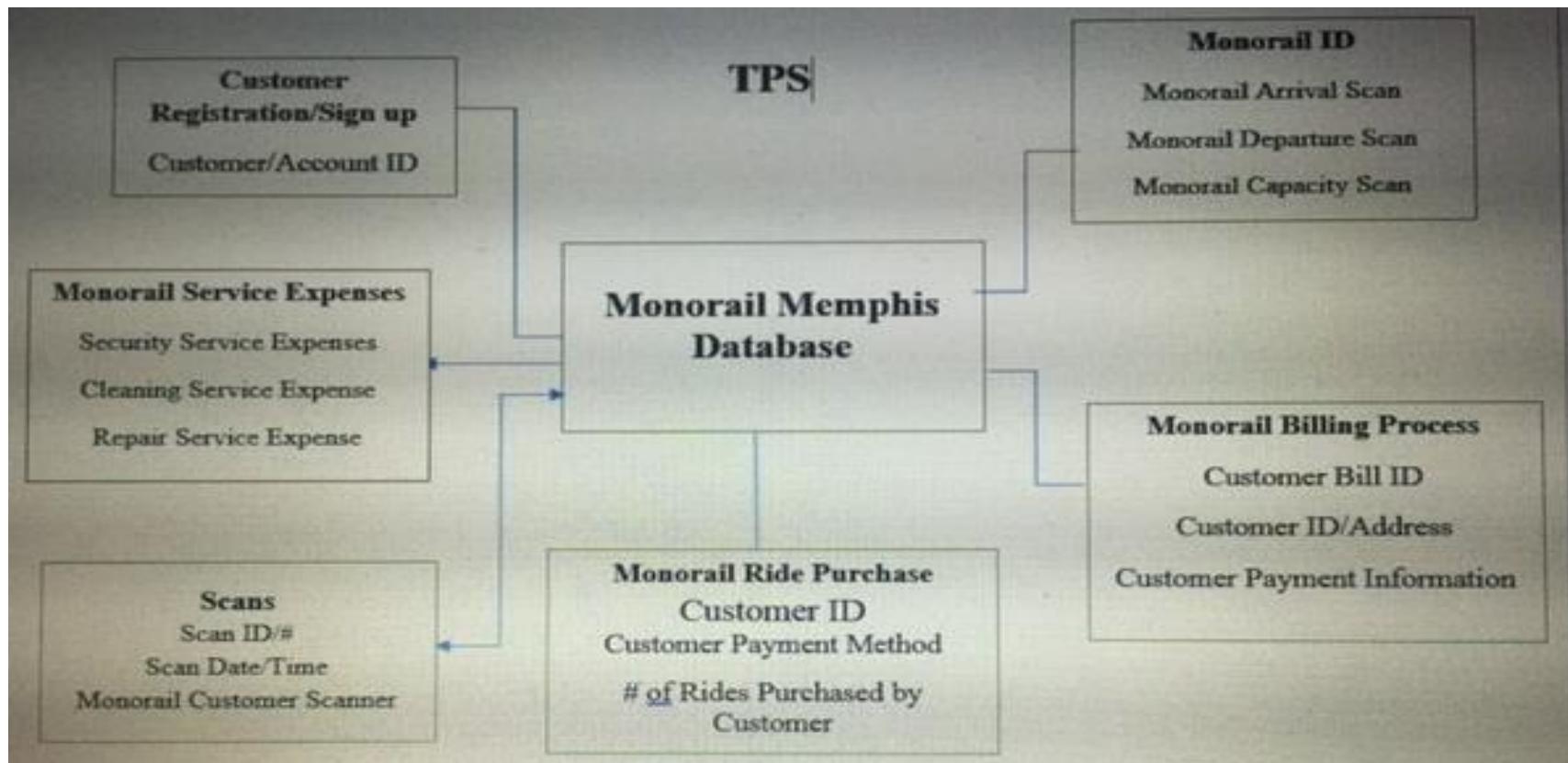
Enterprise Resource Planning

❏ Our ERP systems will extract data from our Functional Information Systems in order to make relationships between data more evident

    ❏ Same entities, properties, formats, validation, and database

❏ These systems will assist our finance resource management, human resource management, and our customer relationship management

    ❏ Have control over the same data, but may manipulate it to suit their objectives

Sales Force Automation

❏ SFA will be used to increase ticket sales by displaying pricing incentives through digital applications such as the Monorail Memphis mobile app or email

❏ Cross-selling - provide complimentary tickets for new customers

❏ Up-selling - entice new customers with higher-value ticketing subscriptions

❏ Bundling - bundle multiple subscriptions and offer it for a slightly lower price

  ❏ Advertised as a family/company ticketing plan

Customer Relationship Management (CRM)

❏ One way we plan on building strong relationship with customers is through incentives.

   ❏ Free rides, guest passes, discounted memberships.

   ❏ This is where cross-selling comes in. (Guest passes)

❏ Through the mobile app, we can do a point system, in which after accumulating a certain amount of points for using our monorails, they receive one free ride on a day they choose.

❏ Customer service numbers are also a way for us to maximize our involvement in problem solving our customers' situations.

❏ Question forums/live chat rooms are also available via the mobile app that connect customers to people equipped to address them.

Outsourcing and Integration Strategy

- Vertical Integration Strategy
  - Control the quality of our product and all the costs associated with making our company the best it can be
  - Focus on most important aspects of our company
- Outsourcing
  - Cleaning Services
  - Repair Services
  - Security Services (2)
    - Security (footage)
  - Payroll

Web Site

Web Site (con't)

Web Site (con't)

Web Site (con't)

Conclusion

To Conclude, we have carefully crafted a city-oriented transportation system that, while offering high security and safety of both individuals and credentials, will truly connect people from point A to point B in the fastest possible form of travel.

A system of the highest-quality and easiest form of access, whether that be the mobile app or simply physical tickets.

Memphis will be connected in a way never before experienced, and our customers will have the privilege of relying on a system that skips traffic altogether while simultaneously reducing the heavy traffic both within the city, and the surrounding highways so often crowded with national travelers.

We are very excited about the change our system will bring, and we hope our customers can share that joy and embrace this wonderful experience in the years to come.
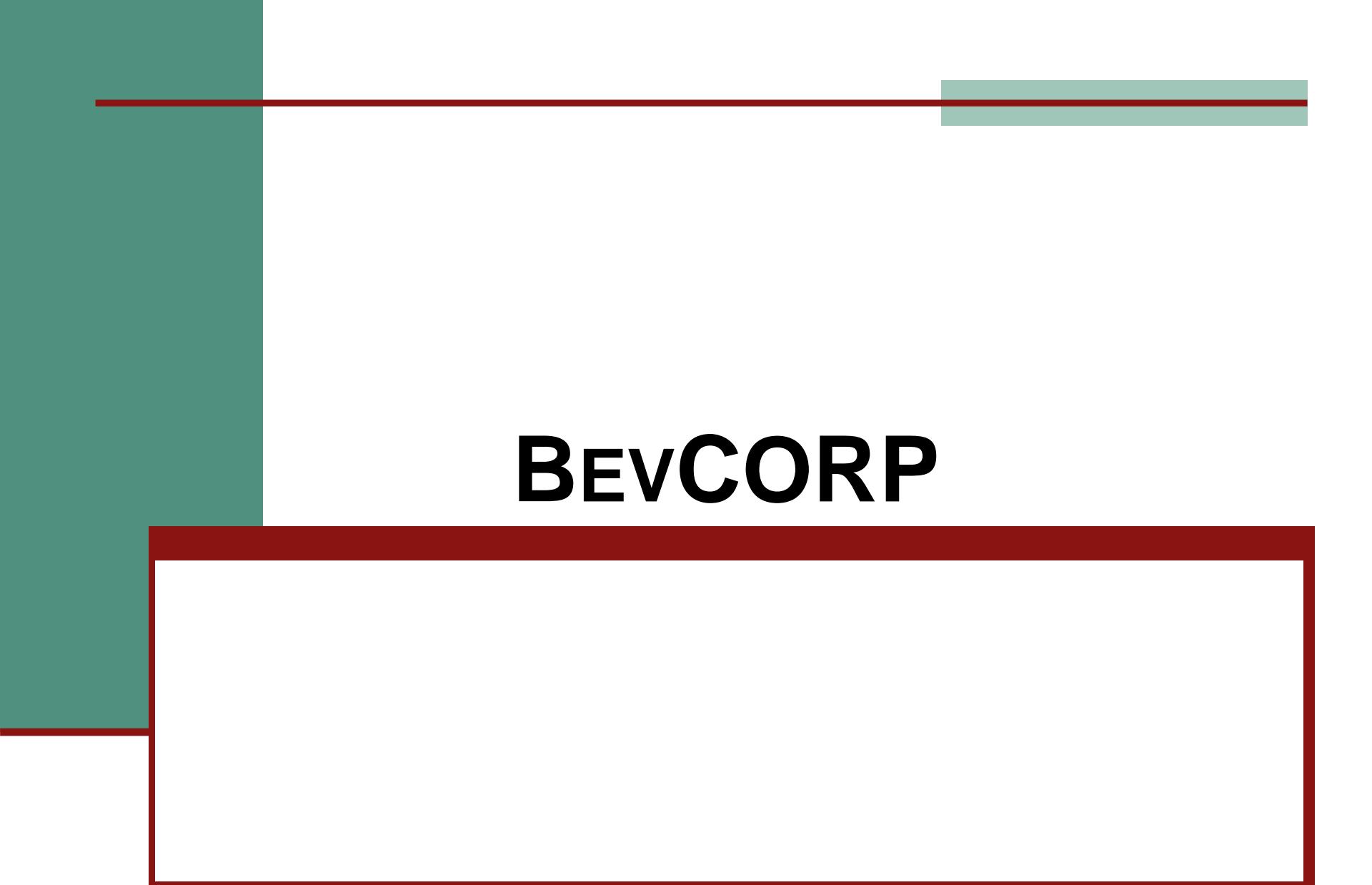
BᴇᴠCORP

Product/Service Specification

- Manufacturing variety of products:

  Non alcoholic Beverages

  - Mineral Water
  - Flavored Water
  - Soft Drinks
  - Energy Drinks
  - Sports Drinks

- Distribution

  Competitive Pricing

  Order Delivery

  - Groceries, Sporting events, Restaurants

  Vending Machines

Strategies for Competitive Advantage

- **Differentiation**

  - Will provide over five different flavors for each of our types of drink, along with a variety of delivery options.

- **Time Strategy**

  - We will be very quick in delivering orders, guaranteeing delivery within 2 days, with overnight optional.

- **Lock in Customers Strategy**

  - Provide discounts to returning/large customers to encourage their loyalty crease Switching Costs Strategy

  - Discourage customers from going to other companies for economic reasons by having the best "per-ounce" prices in the industry.

- **Customer Orientation**

  - Provide extensive scheduling options to fit customer's needs.

  - Concentrating on keeping customers happy by getting it right the first time and satisfying taste buds.

Strategic Use of IT

- All vending machines will use VendScreen to prevent theft, track purchases, and provide nutrition facts according to newly passed government laws. http://www.vendscreen.com/

- GPS Tracking system for all shipments to maximize inventory efficiency

- Smart phones will be utilized during warehouse shipments, trucker rerouting, and upper/lower management communication

VendScreen
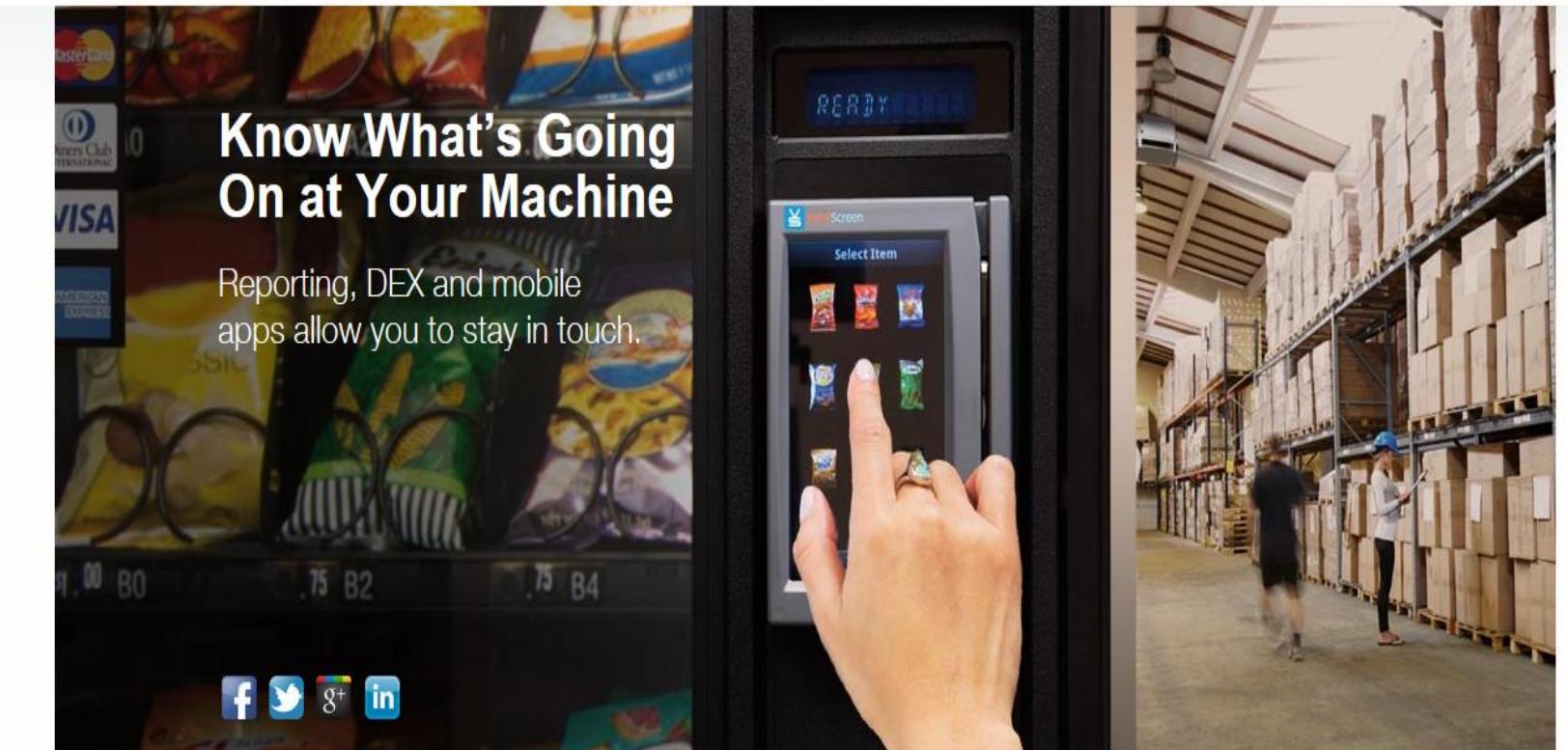
Security (Manufacturing)

- Our products from production to warehouses and factories are secure from contamination.

- We undergo tests on all of our products before they are put on shelves

- Our products are never sold beyond that expiration date

Key Business Processes
Use of IT

·Ability to calculate the lowest price while still making our
   ideal profit

·Machines that produce the drinks quickly and with the
   proper amounts of each ingredient

·Ability to create labels and logos for all of our drinks and
   for the brand

·Printing of labels and making of bottles that contain the
   beverages

Key Processes (cont'd)

- Ability to calculate (and adjust to, if needed) the number of beverages to be made and stored (inventory control)

    without having too few,

    or too many that will end up going bad

Ability to calculate the dates which the drinks will go bad by

Effective/quick processing of our products as well as delivery times to drink machines/grocery stores/restaurants/sports venues…etc

Web Site Design

Home Page

Home Page Drop Down Menus

Order History

Order Tracking

Delivery Process

BevCorp

About Us | **Services Info** | **Contact Info**

Welcome

John Doe

Place Order

Pending Orders

Order History

Track Shipment

Order Feedback

Delivery Process

At BevCORP, we strive to take advantage of new technologies in order to garuntee the timeliness of your order, provide you with tracking updates in real time from our drivers, and to endure the proper handling of your materials. All shipments are logged on departure, as well as periodically during the shipping process. All packages relating to an order are given a unique QR code to speed up the sorting and delivery process; these can also be scanned upon order delivery by most smartphones to confirm order accuracy. All trucks are fitted with GPS tracking systems as well as onboard computers relaying position, mechanical status, and other critical information. These technologies allow us to provide fast, efficient, accurate service.

Database Prototype
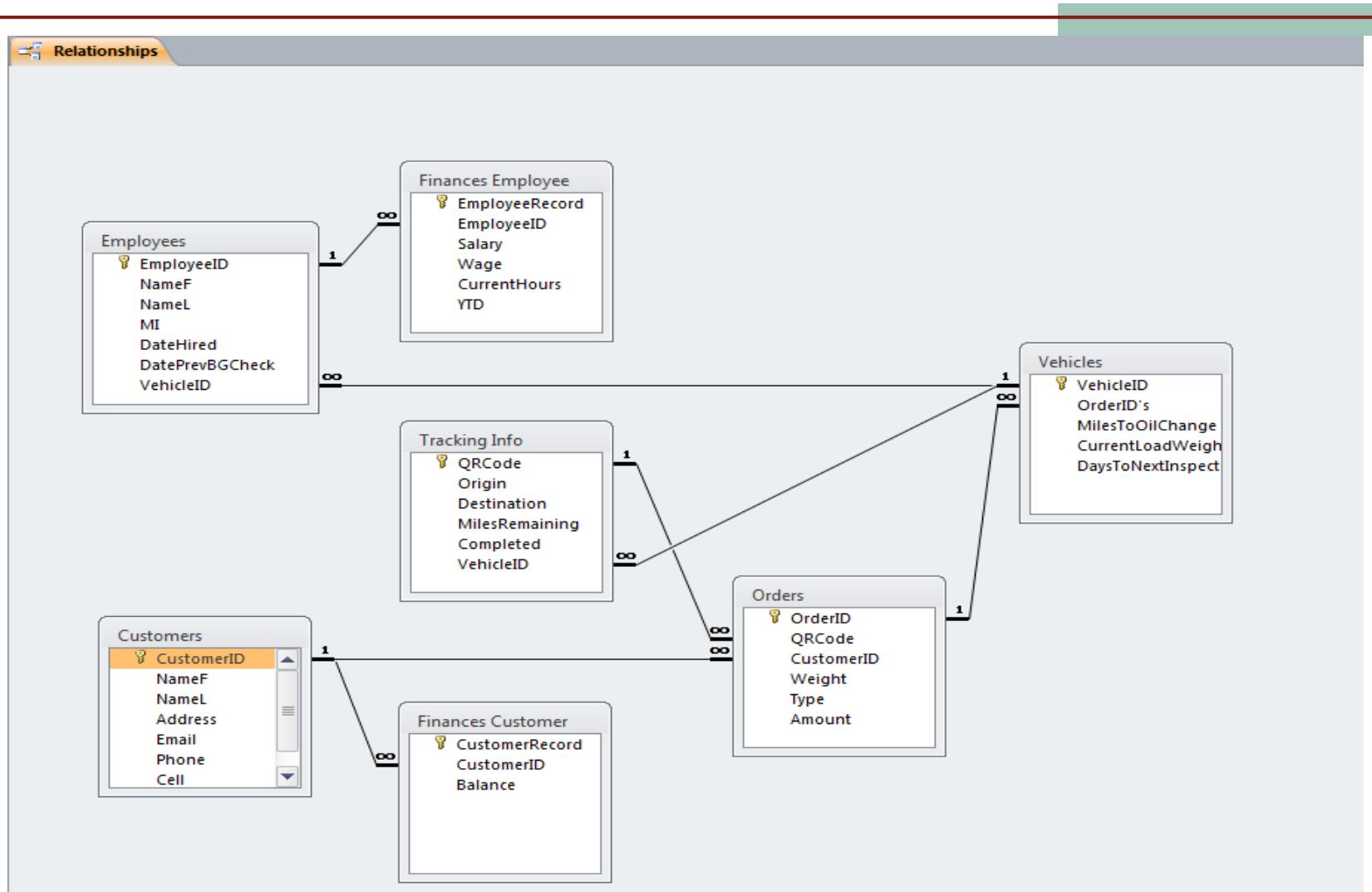
BevCorp Mobile Commuting

- Have updated communication between orders and customers
- Set up Wi-Fi spots at all warehouse/corporate offices with the latest WPA technology to ensure all customer information is safe with BevCorp
- Use Radio Frequency Identification to track all deliveries from beverage warehouses
- Utilizing an effective system of smart phones to:
  - -Droid/Apple application
  - -Purchase orders
  - -Determine shipping type
  - -Track shipments
  - -Write reviews about your orders
  - -SMS message sent whenever product is delivered

TPS

TPS systems are utilized in all of our warehouses and handheld computers used to track and collect data about shipments. This data is uploaded to our servers that would be available through ID entrance off of our website. We track this data from the purchase until the product is delivered. Focus on scan entries and order entries.

For online order, our TPS tracks sales and processes data to maximize efficiency

OLTP processes order immediately and places them in groups based on region

Vending Machines will have POS Systems available to accept credit cards and all information is uploaded to databases to track efficiency

Decision Support Systems

Three Decisions Levels that IT will help guide changes and progress

Operational Control

Involves Production monitoring. Managers use the support systems to monitor production efficiency and can make wise decisions in relation to buying new equipment, speeding up production, inventory controls, and scheduling of employees, shipments, and manufacturing.

Management Control

Management uses these systems for credit evaluations of new clients, creating budgets for upper management for production and expansion. Also, managers will use support systems for project scheduling

Strategic Planning

DSS will be used to help in the planning of building new plants, merging and acquisitions of other companies, new product planning, and quality assurance planning

Acquisition/Outsourcing

We chose to outsource all of our IT applications to companies that specialize in IT development.

> All Smart Phone applications will be designed and updated by the IT Company

> However, in order to keep collaboration and creative programming to match BevCorp's goals, the IT personnel will be constantly briefed on our business desires.

- The IT company and personnel will spend several hours each month in meetings with upper management to design new applications to stay ahead of the competitions
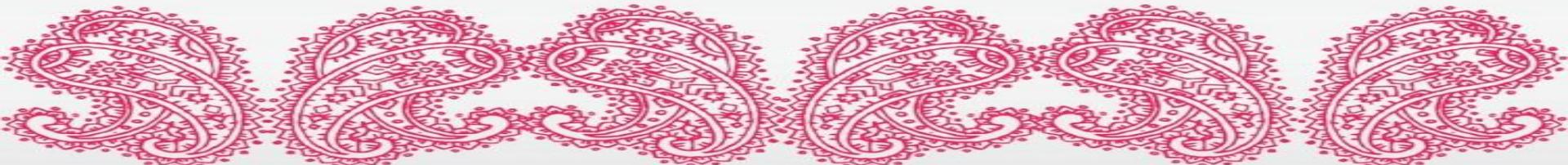
Peek A Boo

Peek-A-Boo
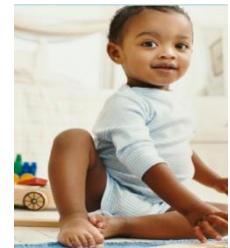
Peek-A-Boo is a boutique in the retail industry specializing in everything baby related. What makes Peek-A-Boo stand out against its competitors is it being a boutique as opposed to a regular baby store. It is not run by a large corporation, which gives our store the ability to have more lenient policies that will better satisfy the customer.

Peek-A-Boo's Mission
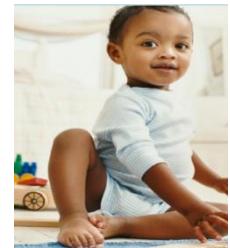
Our mission at Peek-A-Boo is to become the number one boutique in Memphis for all things baby by selling high quality, fashionable, and most importantly, comfy clothes for both mommy and baby. Peek-A-Boo is not limited to just providing clothes, as we also carry baby necessities and accessories, while providing excellent customer care with customer satisfaction guaranteed.

Peek-A-Boo's Vision
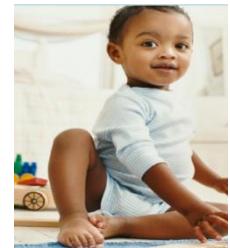
Within the next five years, we at Peek-A-Boo look forward to at least an 80% increase in awareness of the boutique locally and in surrounding areas. We also hope to include new styles in our inventory while keeping true to our quality care, and also a store expansion in some major cities of Tennessee like Nashville and Knoxville.

Peek-A-Boo's Products
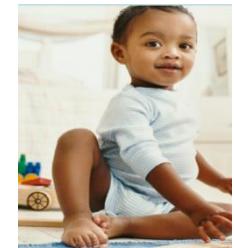
The products that we offer at Peek-A-Boo consist of mainly:

- Maternity, New Born, and Toddler clothing
- N & T shoes/booties/socks

Peek-A-Boo also offers some baby necessities as well:

- Bottles, pacifiers, teething rings
- Toys/bears
- Breast pumps, pads, bras, etc.
- Car seats, strollers, bedding, etc.,
- Diaper bags
- Baby monitors

Peek-A-Boo's Services
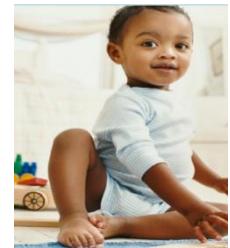
In addition to the products that we offer, we also provide services mainly from our online site. These services include:

- Online baby registry
- Emails and newsletters
- Customer service guarantee
- Free shipping (on select items over $100)

Strategies For Competitive Advantage

- Lock in customers: Peek-A-Boo offers returning customer specials and other promos and goodies for those that sign up to be loyal customers.

- Increase switching costs: because babies have sensitive skin that can be prone to rashes and uncomforting, Peek-A-Boo's apparel, made with quality material gentle enough for babies, should be sought after.

Strategic Use of IT
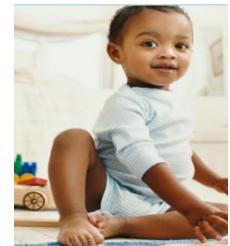
Peek-A-Boo's success stems from the use of IT in both the marketing and planning of our goods/services but also as a part of it. IT plays a part in pre-planning strategies, such as:

- <u>Customer analytics</u>: the data that will help Peek-A-Boo tailor our products and services to our target market's needs and expectations.

- <u>Forecasting:</u> a strategic system in which customer buying trends are predicted, which helps to optimize our inventory.

- <u>Promotion, price, and assortment optimization</u>: strategic system in which we will use the target data collected to determine the best way to optimize our promotions, price, and assortments.

Strategic Use of IT
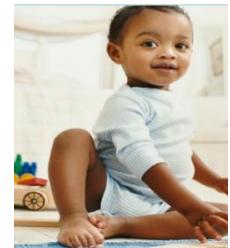
IT is applied all throughout our operations from:

- Entering and keying in special promotional codes offered
- Scanning products and checking out customers
- Accessing a customer's (provided) information to recommend related products to their most recent purchase
- Keeping track of our inventory through a computer system.

IT is also used in our online website, where customers can gain and maintain information about our products and services.

Critical Success Factors
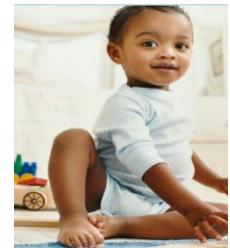
- <u>Obtaining new customers and/or distributors</u>: These are the future of Peek-a-boo Baby Boutique. They are the securing factors and help bring longevity to the organization. We can achieve this objective by utilizing our competitive advantage, such as high-quality manufactured clothing, to attract new clientele.

- <u>Customer satisfaction</u>: To appease the customers, Peek-a-boo will emphasize on quality clothing for both the baby and mommy, provide a variety merchandise that will enhance the life of the mother as well as the baby, and affordable prices to create and develop a pool of loyal consumers.

Critical Success Factors
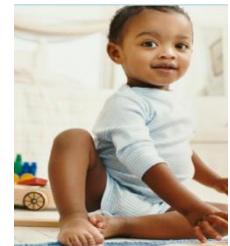
- Quality: Peek-a-boo Baby Boutique will provide superior crafted clothing for the baby to better the lives of the next generation.

- Product or service development: Peek-a-boo will offer top of the line services and products for the mother and child such as a specialized consultant on site to share knowledge and understanding to all mommies, a plethora of products to enrich the lives of the mother and child, and offer promos and other bonuses for loyal customers.

Critical Success Factors
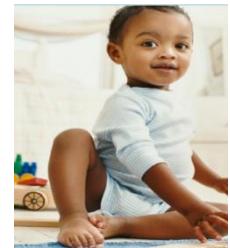
- <u>Strategic relationships</u>: To expand the company, Peek-a-boo must create and build many relationships with customers, thereby, the buyers can be the promotional agent by spreading our superior services and goods by word of mouth, social media, or any other strategic technique that can be utilized to put the organization on the map.

- <u>Employee attraction and retention</u>: Peek-a-boo Boutique plans to attract new customers by advertising through flyers, word of mouth by customers, and social media. To keep our clientele, we will offer incomparable services and merchandise to enhance the lives of both mommy and baby.

Security and Ethics
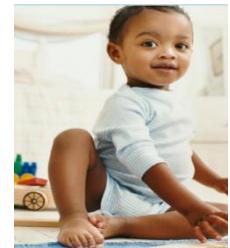
- <u>Risk Analysis</u>: Peek a Boo will evaluate the value of each asset that is protected, pinpoint potential threats or dangers to it, estimate the prospect of the asset being compromised, and compare the costs of it being compromised with the cost of protecting it.

- <u>Risk Mitigation</u>: Peek a Boo will take measures against risk where its functions include:
  - Establishing borders of control to avert detected threats from occurring.
  - Protecting assets from detected threats.
  - Craft a recovery plan if there is a threat and the asset is compromised.

Security and Ethics
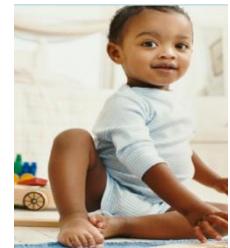
- Access Control
 - Peek a boo employees will have to identify themselves as some form of authorized personnel to have access to the assets of the company.

- Authentication: Methods used to access the organization's assets.
  - Password can be used to enter Peek a Boo's secret asset information.

  - Thumbprint scan can be used to access authorized documents.

Security and Ethics
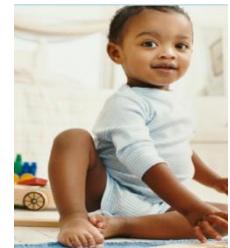
- Peek a Boo will a have a tracking system to watch the behavior of personnel closely online who has access to the assets.

- Peek a Boo will have an Access Control List where there is a specific list of those who have access to the assets.

- Peek a Boo will use external auditors to audit our assets to ensure there is honesty and the company remains ethical.

Security and Ethics
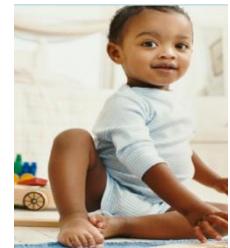
- The company will create disaster recovery plan to know what options are available to the company if disaster struck.

- The organization will craft a disaster avoidance plan which includes ways to prevent disasters.

Entities & Key Operational Processes

- The entities of the company are:
  - Customers
  - Employees
  - Suppliers
  - Orders
  - Inventory Transactions
  - Purchase orders
  - Purchase order details

- Our key operational processes includes:
  - Entering promotional codes into our database
  - Scanning the products
  - Checking out customers
  - Accessing customer's information through our database
  - Keeping track of inventory through our IT system
  - Entering Customer's information into the system

Entities & Primary Keys

Website Design

Home Page
- Peek-a-boo
  - About Us
  - Mission Statemnt
  - Vision Statement
  - Products
  - Services

Customer Login
- Current Member Login
- Order Information
- Tracking Shipment

Customer Service
- Our Policies
- Create Account
- Billing Information
- Current Invoice
- Customer Claims

Place Order
- Paypal
- Discover
- American Express
- Visa
- Master Card

Contact Us

Help
- FAQs
- Tech Support 24/7
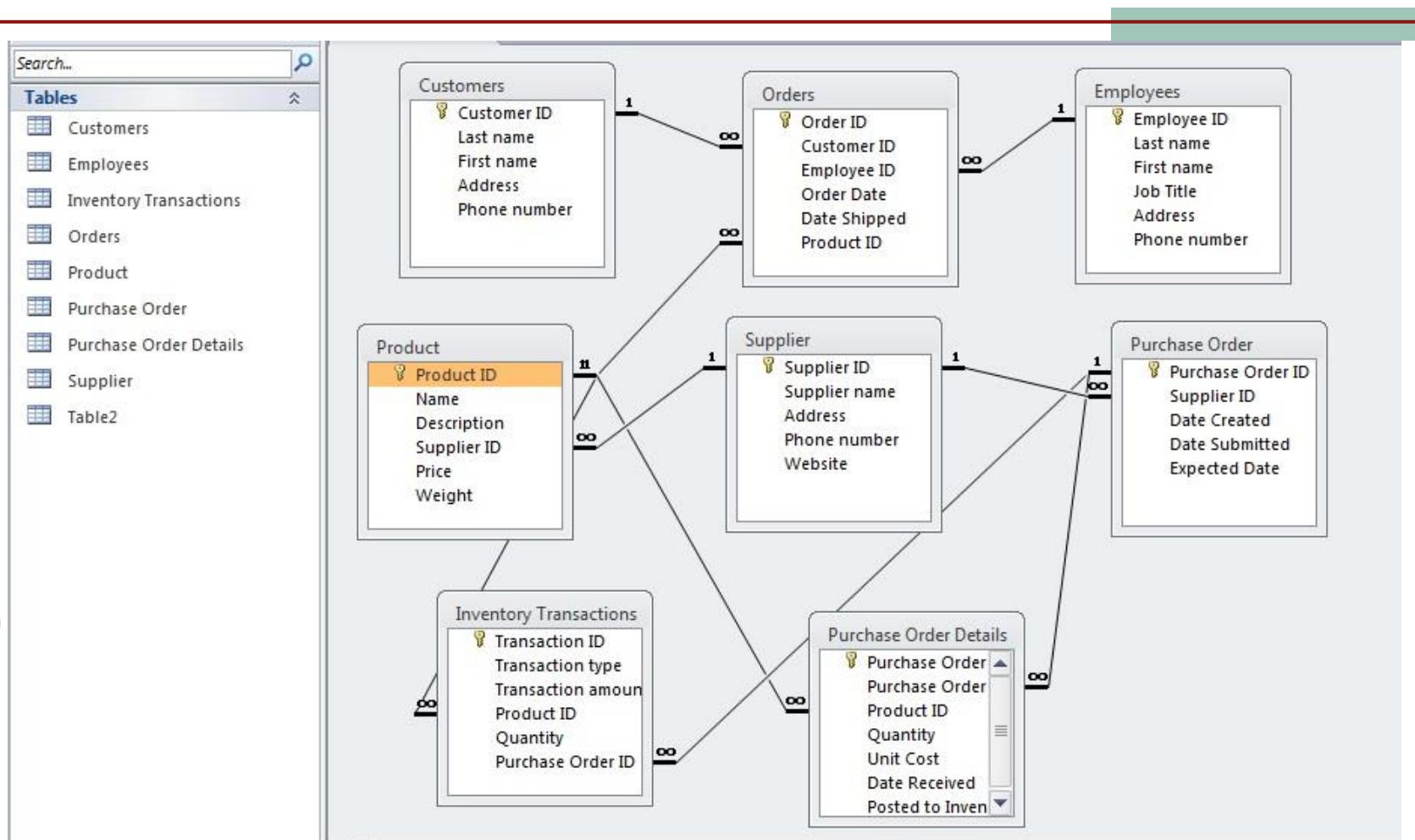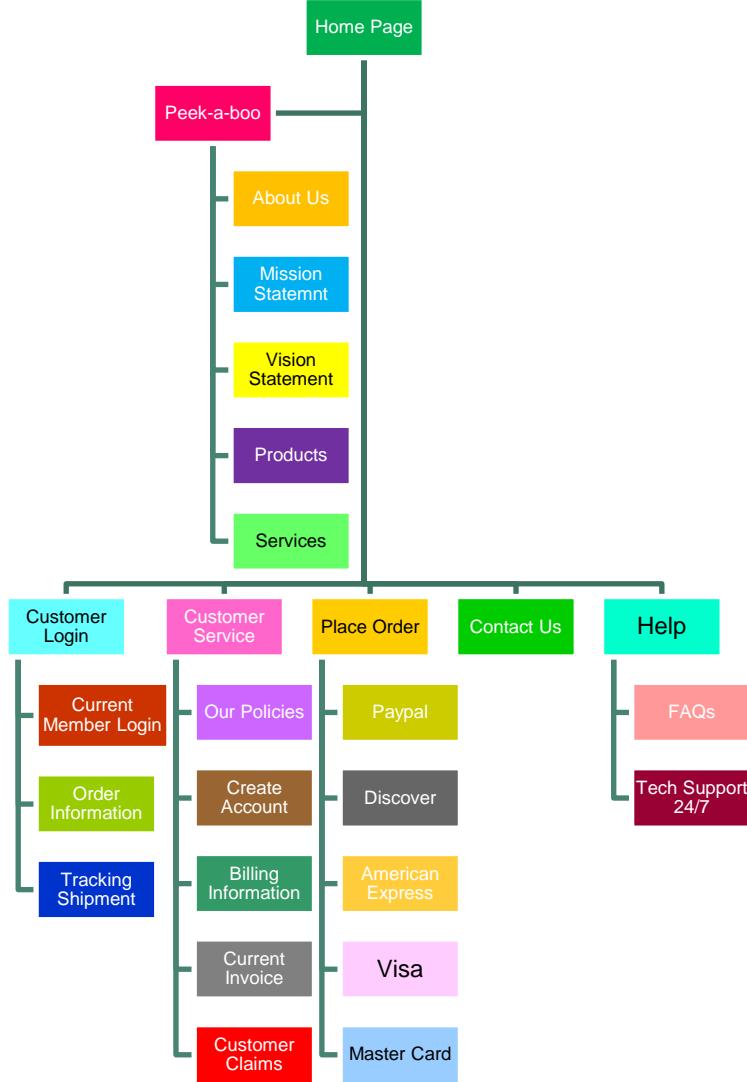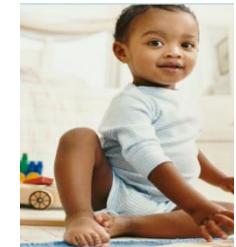
Website Design Breakdown

Website Design Breakdown Cont.

```
                    Customer
                     Login
                        |
        +---------------+---------------+
        |               |               |
    Current          Order          Tracking
  Member Login    Information       Shipment
```

Website Design Breakdown Cont.

```
                    Customer
                    Service

Our          Create      Billing       Current      Customer
Policies     Account     Information    Invoice      Claims
```

Website Design Breakdown Cont.

Place Order

Contact Us

Help

FAQs

Tech Support 24/7
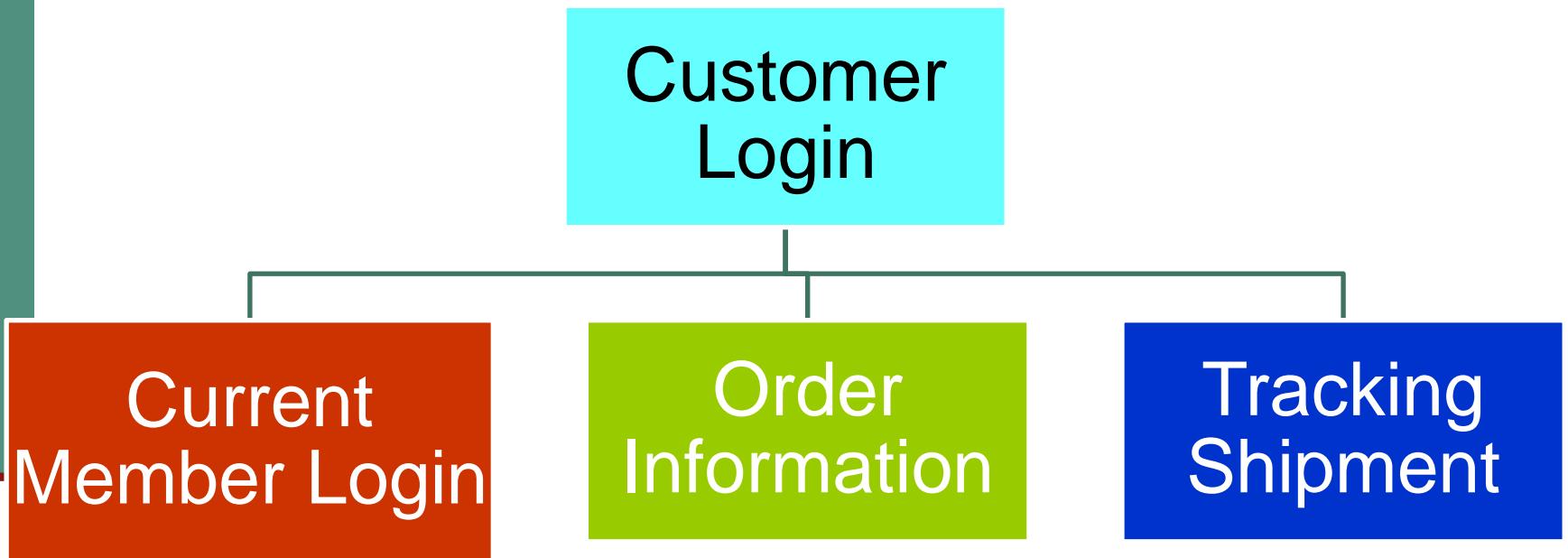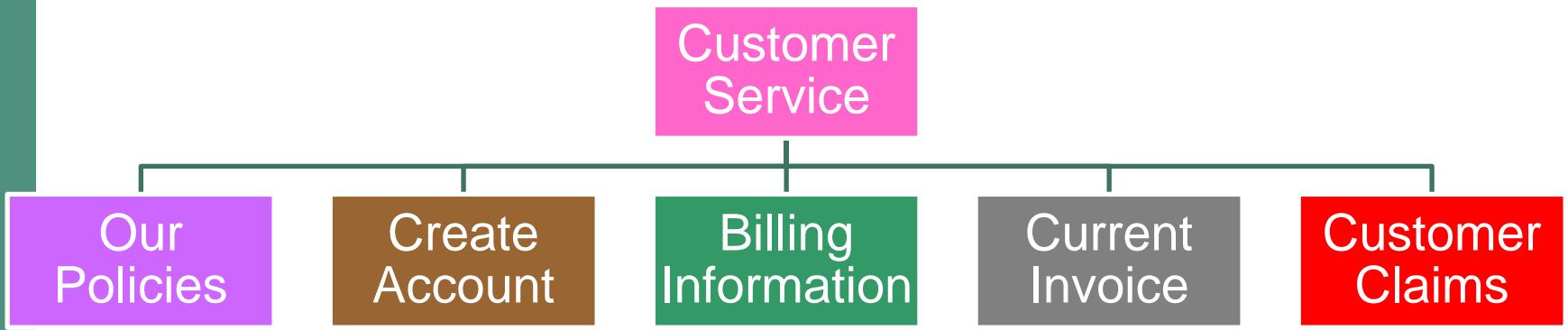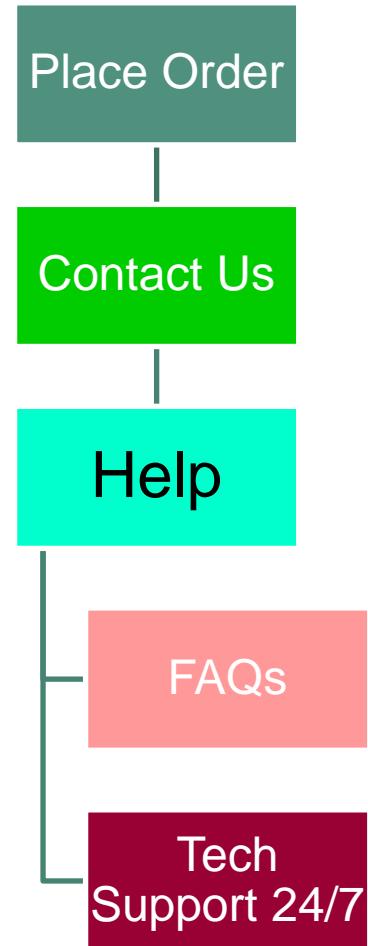
Design Questions
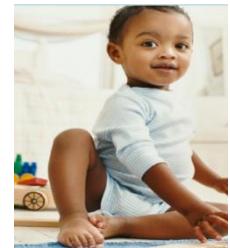
- **Peek-a-boo will communicate brand through:**
  - Flyers
  - Word of mouth
  - Internet Searches

- **Our website unique characteristics includes:**
  - New styles in our inventory while still incorporating quality clothing for both mother and baby
  - Online baby registry
  - Emails and newsletters
  - Free shipping (on select items over $100)

- **Visitors will continue to shop at Peek-a-boo due to our:**
  - Our reliable services and great customer service
  - Quality clothing
  - Easy to track shipment
  - 24/7 Tech Support
  - Discount Coupons for loyal customers
  - Free shipping (on select items over $100)

# Design Questions Cont.
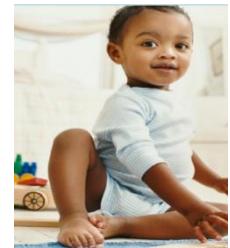
- **Interactive content the site needs is:**
  - Email
  - Social media content such as Facebook and Twitter where customers can tell others about their experience
  - Customer Login and account set up
  - Tracking shipments

- **To keep people interested, Peek-a-boo will:**
  - Keep the website vibrant and alive to catch the eye of the potential customer.

- **There will be a "community" established where:**
  - A form will displayed on the website for the customer to fill out for complaints
  - Facebook and Twitter can be used to rate the customer's experience

Design Questions Cont.
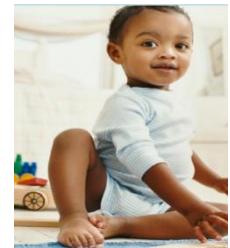
- **Multimedia components that will be used to accomplish our objectives encompasses:**
  - Database to store customer information
  - Email where customers can receive promotional coupons and discount offers
  - Electronic payment where customers to send payments online
  - Facebook and Twitter to discuss experience

- **Peek-a-boo will devote a section of the website for customers to receive help and provide feedback. Factors include:**
  - A complaint form that can be filled out online with feedback on experience
  - Social media used to rate service
  - Contact email that can be used for complaints as well

- **The site will include product pictures and descriptions:**
  - To keep the site alive, unique, and as a marketing mechanism

Design Questions Cont.
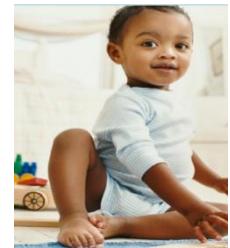
- **Our site will include lists of: services, fees, and related information**
  - Products such Bottles, pacifiers, teething rings
  - Services such as online baby registry, emails, and newsletters
  - Prices for all merchandise
  - Tracking shipments
  - Online payment options
  - Any other information the customer wants to know

- **Peek-a-boo's site will include forms for:**
  - Complaints and dissatisfaction of services by the customer.

- **The site will be connected to a database to:**
  - Obtain customer information such as what their shipment includes, track where the order is, and when it is expected to arrive for pick-up or delivery

- **External links will not be used.**

Wireless Mobile Communications

The vast growth in wireless technology has made it almost a necessity to utilize in business operations. Because Peek-A-Boo is both a physical store and an online store, it is important that our employees are able to access information and data securely between their mobile devices(when they are on the move) and stationary PCs(when they are at work). It is also essential that consumers are able to access the website and be able find information about our business easily from their mobile devices.

Wireless Communications

It is important for Peek-A-Boo to utilize a secure wireless network in order for employees to connect, find, and share information and data on the go. It also allows multiple tasks to be completed at the same time (such as orders being made online, or products being purchased at the store) and be available in one network, making it easier for employees to review.

Mobile Commerce
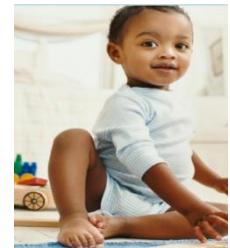
     M-commerce allows customers to conduct wireless transactions via the internet and is essential to Peek-A-Boo because customers will be able to access our online site and not be limited to shopping and purchasing solely at the physical store, which will help to increase our sales revenue and help us to become a more successful business.

     Peek-A-Boo will become a more customer-oriented and efficient business by creating a shopping app and by ensuring that our online shopping services are available and accessible through mobile devices.

Mobile Commerce
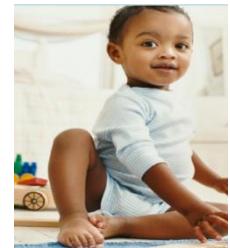
Although there are a few different methods to reach customers wirelessly with information about our products and services, one main method will be with the utilization of QR codes.

QR codes are important to use as a marketing tool because of the wide range of smartphone users. Our QR codes will be on our flyers and other areas, such as magazines and signs, and will link directly to our online site, where consumers will be able to navigate their way through information about us and about the products and services that we offer.

Telecommunication
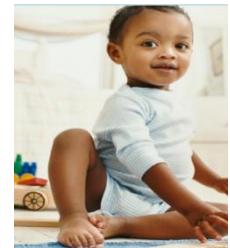
Although mobile telecommunication is good for those employees that would like to be home-based, it is not practical to utilize this at Peek-A-Boo because it does not fit our particular business industry.

Transaction Processing System

Peek-A-Boo's transaction processing system includes processes in:

- Financial /accounting:
    - accounts payable and receivable (keep track of customer transactions with Peek-A-Boo and of Peek-A-Boo's transactions with vendors)
    - forecasting (gain a good insight as to how Peek-A-Boo's sales will be in the future, which will determine how cash and other transactions are managed)
    - financial reporting (keep tabs on Peek-A-Boo's financial records between each reporting period).
- Production/operations:
    - inventory management and purchasing (keep track of inventory in the store and online to determine what products to purchase more of and how much of it to purchase)
    - shipping and distribution (for Peek-A-Boo's online site, to determine how to get items purchased online delivered to the correct destination).

TPS cont.

- Sales marketing:
  - order processing and billing (for both physical and online store, to ensure customers' orders are taken into the system quickly and to make sure customers are billed correctly only for what they ordered)
  - contracts (what vendor(s) Peek-A-Boo orders from) sales planning (determine which items are the most or least popular in the boutique and which items to upsell)
  - pricing (how to price Peek-A-Boo's products compared to competitors' pricings)
- Human resources:
  - personnel administration (who is in charge of making sure the boutique is running as it should be)
  - performance management (how well Peek-A-Boo employees are working and how to improve it even more)
  - payroll and compensation (paying employees in a timely manner and encouraging employees to work even harder to sell more products)

Management Information Systems

Peek-A-Boo's management information systems provide information to us by increasing the efficiency in the same areas as the transaction processing systems.

These functions consist of:

- Financial/accounting:
    - financial planning (how much money does Peek-A-Boo have to run a successful business)
    - budgeting and budgetary control (keep track of how much money is being used in Peek-A-Boo's business and compare it to how much Peek-A-Boo should be using)
    - auditing (making sure Peek-A-Boo is doing good financially)
- Production/operations:
    - inventory management (how much inventory Peek-A-Boo should keep and when more products should be ordered)
    - quality control (to make sure our products are free of any defects when being purchased inside of the store or being shipped to a customer)

MIS cont.

- Sales marketing:
  - customer relations (Peek-A-Boo will get to know the customers and learn their preferences which will increase customer satisfaction and give us a good reputation among competitors)
  - Sales force automation: (Peek-A-Boo will utilize a software for the physical store and online to help with processing large amounts of orders)
- Human resource:
  - hiring/recruitment (Peek-A-Boo looks for hardworking people who are genuinely happy to help people and to work)
  - training and performance evaluation (ensure that highly trained workers, both new and old, can deliver the most amount of satisfaction to customers)
  - employee records (keep on hand updated information about the employee and whether or not they are suitable for a job at Peek-A-Boo)

Decision Support Systems
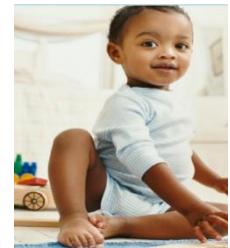
- IT Decision Support Systems will be used to evaluate:
  - Profit/loss for each quarter
  - Employee performance
  - Quality of clothing and other products
  - Customer service and how well employees answer client's questions in the store and over the phone, email, etc.
  - Efficiency of manufacturing clothing
  - Efficiency of merchandise being shipped and distributed
  - Utilization of website by customer to decide the pros and cons of the site
  - Our marketing strategy and the steps needed to become more competitive
  - How well services are rendered to customers

Acquisition and Outsourcing

In order to stand out from our competitors, Peek-A-Boo will customize and build our own software so that it can tailor to our exact needs.

The two most important IT applications that will set us apart is:

1. Online/web design: This will allow us to customize and make our site exactly the way we need to promote a reputable image and gain/sustain a nice amount of customers.

2. Customer relationship management: Although there are many CRM software available, our software will be customized to not only allow for a smoother transfer from in-store to online customer and vice versa, but also to organize customers based on their interests and buying behaviors.

Acquisition and Outsourcing

In order to run an efficient business, it is crucial that IT applications are used extensively. For Peek-A-Boo, software for the core functions of a business will be bought because it is possible to find "off-the-shelf" (OTS) software tailored for basic IT needs. These general systems consists of:

- Operating systems
- Accounting and finance applications
- System administration software
- Development tools

Because these systems are fundamental for running a business, it is easier to find an OTS software to meet our needs rather than spend time and money creating our own.

Integration Strategy
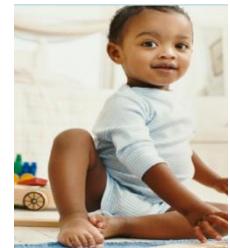
The IT applications, such as the operation systems and accounting/finance applications, will help Peek-A-Boo keep track of and meet sales goals and stay within the financial budget for a set period. IT applications revealing trends and material pricings will allow Peek-A-Boo to stay true to our mission to deliver high quality, fashionable attire.

The IT used in our website and our own CRM software will allow Peek-A-Boo to be able to successfully operate online and will help to build our customer relations, which will help us

Database Prototype
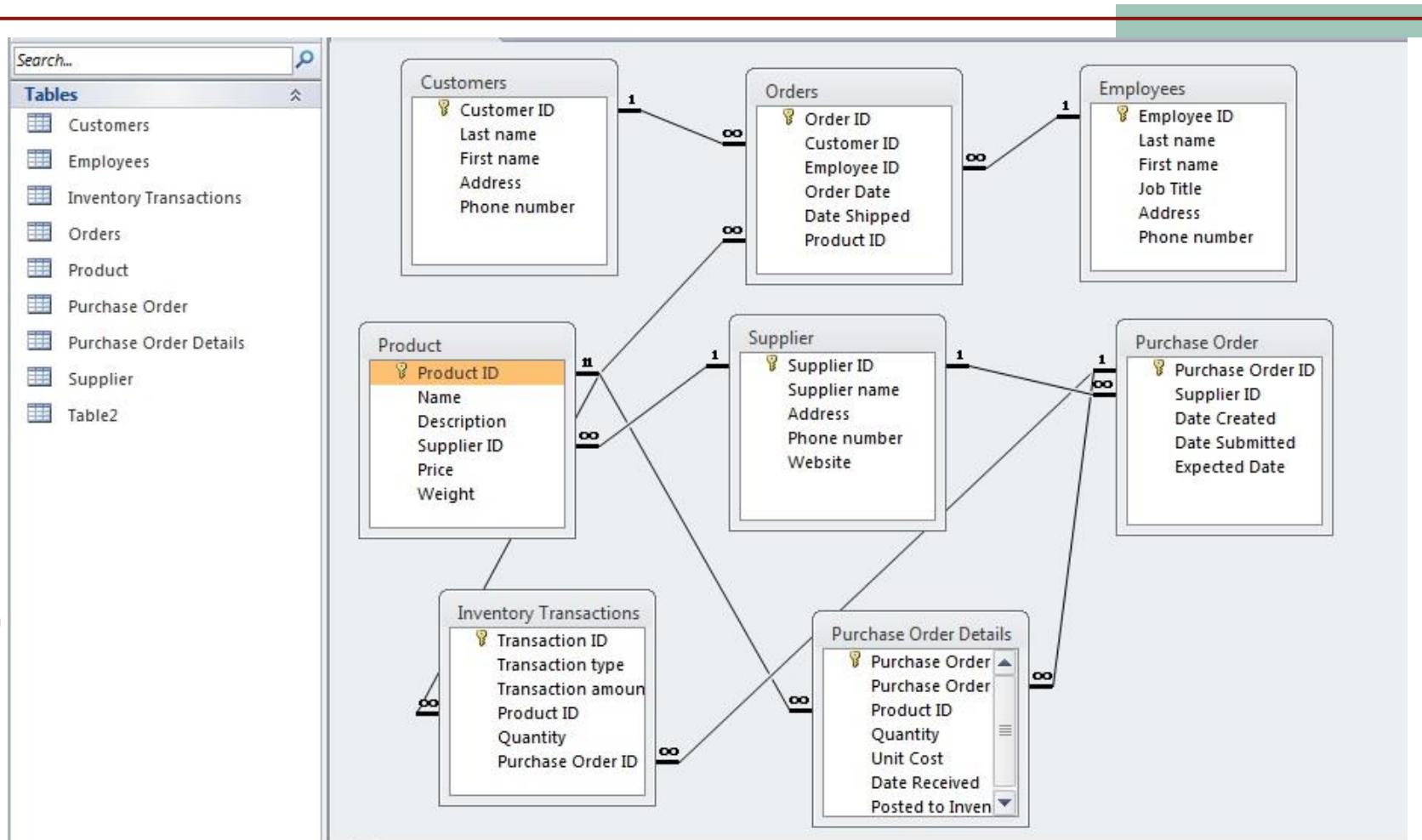
Web Prototype
(Home Page w/ Dropdown Box)

Web Prototype (Home Page w/ Dropdown Box Cont.)

Web Prototype (Home Page)

Web Prototype (About Us)

beautiful things come in small packages

HOME | Peek-a-boo | Customer Login | Customer Service | Place Order | Contact Us | Help

About Us

Peek-A-Boo is a boutique in the retail industry specializing in everything baby related. What makes Peek-A-Boo stand out against its competitors is it being a boutique as opposed to a regular baby store. It is not run by a large corporation, which gives our store the ability to have more lenient policies that will better satisfy the customer. Lastly, our 24/7 Help line has specialized consultants on standby if mommies, new and veterans, have any questions about their precious bundle-of-joy.

Because Peek-A-Boo is both a physical store and an online store, it is essential that consumers are able to access the website and be able find information about our business easily from their mobile devices. Our mobile commerce allows our customers to conduct wireless transactions via the internet. This is important to our organization because customers will be able to access our online site and not be limited to shopping and purchasing solely at the physical store. Also, Peek-A-Boo wants to become more customer-oriented and create a more efficient business by creating a shopping app to ensure that our online shopping services are available and accessible through mobile devices.

Web Prototype (Our Mission Page)

beautiful things come in small packages

HOME · Peek-a-boo · Customer Login · Customer Service · Place Order · Contact Us · Help

Our Mission

Our mission at Peek-A-Boo is to become the number one boutique in Memphis for all things baby by selling high quality, fashionable, and most importantly, comfy clothes for both mommy and baby. Peek-A-Boo is not limited to just providing clothes, as we also carry baby necessities and accessories, while providing excellent customer care with customer satisfaction guaranteed.

Web Prototype (Our Vision Page)

Our Vision

Within the next five years, we at Peek-A-Boo look forward to at least an 80% increase in awareness of the boutique locally and in surrounding areas. We also hope to include new styles in our inventory while keeping true to our quality care, and also a store expansion in some major cities of Tennessee like Nashville and Knoxville.

Web Prototype (Our Products Page)

beautiful things come in small packages

HOME | Peek-a-boo | Customer Login | Customer Service | Place Order | Contact Us | Help

Our Products

New Born and Toddler clothing, shoes, booties, and socks
Bottles, pacifiers, teething rings, diaper bags
Car seats, strollers, bedding, etc.,
Baby monitors

We know that finding quality, trendy clothing for your baby can be a challenge. Well your concern is over because all of our clothing is manufactured with 100% pure organic cotton where babies with sensitive skin to severe skin medical conditions can wear our clothing. Peek-a-boo make it our job to make sure your child is wearing the most soothing and relaxing fabrics to enhance their daily lives.

Additionally, we understand that babies require certain necessities. Therefore, to help make your shopping experience easier and more pleasant, our inventory includes products such as bottles, strollers, and baby monitors so that you will not have to go any where else to finish all of your shopping.

Maternity clothing
Breast pumps, pads, bras, etc.

Web Prototype (Our Products Page Cont.)

Maternity clothing
Breast pumps, pads, bras, etc.

We could not leave the mothers out! We offer stylish, comfortable, durable maternity clothing to help the mommy-to-be to feel at ease during her journey of the pregnancy. We understand that many of the maternity wear today is not only not trendy, but some do not fit the mother's personality or needs. On the bright side, Peek-a-boo has you covered!

Sometimes as a mother you have to purchase items that you need to enhance the life of your baby. Purchasing such personal products such as nursing bras can be uncomfortable to buy amongst large crowds. Greatly, we offer these necessities in a small, safe, intimate environment so that the mothers can feel more at ease and unshamed to buy these precious items.
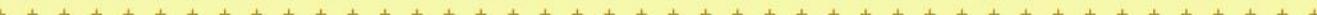
Toys and Stuffed Animals

Toys are a must for babies. The first years of their lives are the most precious because these are the years where their minds and imaginations are developing and shaping for the future. Toys enhance this part of the brain. Therefore, we offer a wide variety of stuffed animals that fit all personalities. Why don't you purchase one for your baby?

Web Prototype (Services Page)

Our Services

In addition to the products that we offer, we also have superior services mainly from our online site. These services include:

- Online baby registry where mommies-to-be can create an account and pick items from from our wide inventory to put on their wishlist for friends and family to purchase for the baby shower.

- Emails and newsletters where customers can receive promotional codes and news about upcoming sales as well as information about business news and updates.

- Customer service guarantee where Peek-a-boo promises to offer superb services whether you may have a question about how to make online payments or assistance with suggestions on what products are better suited for you and your baby's needs.

- Free shipping (on select items over $100)

Web Prototype (Place Order Page)

To Place an Order

from our online store

BUY ONLINE

* * * * * * * * * *

via Paypal

Buy Now

* * * * * * * * * *

or Contact Us at:

1-800-734-8899

or

peekaboostyles@gmail.com

* *

Name

Email

Subject

Message

Send

Web Prototype (Contact Information Page)
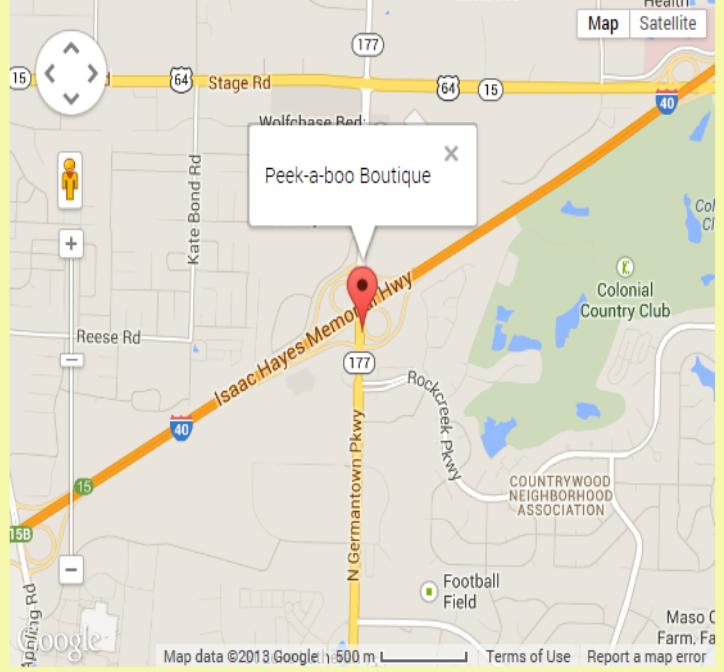
Final Summary

Peek-A-Boo, in order to become a successful baby boutique in Memphis, will utilize IT applications in most of, if not all, processes needed to operate a business. Because of the worldwide use of technology, Peek-A-Boo will also operate online and offer specials and promo codes to keep it running successfully.

By implementing different IT applications and strategies in the planning process, marketing and advertising, and web design, we at Peek-A-Boo will work hard to reach our vision of being well-known in the Memphis (and surrounding) areas, and to expand into neighboring states to further our franchise.

TranZip

MISSION STATEMENT

- We at TranZip have revolutionized the transportation industry by introducing the first ever ride-hailing service for self-driving vehicles. With our simple and convenient TranZip vehicle booking app, getting places has never been faster or more effective.

Vision Statement

- TranZip is dedicated to bringing in a new era of ride-hailing by implementing the use of self-driving vehicles. With the continuous improvement of our TranZip vehicle-booking app, we will become a leading company in the ride-hailing industry. Together with our partner, Tesla, we will create a cleaner, quicker, and safer future for the transportation industry. By increasing the use of fuel-efficient vehicles on the road, TranZip believes we can transform transportation by 2030.

Product & Service Specification

- TranZip vehicle-booking app for automated and fuel efficient vehicles for public and personal use

Value/Supply Chain

TranZip Vehicles and Services

- Consumer Cars and rentals
- Public Transportation Vehicles

Consumer App

- No hassle travel planning and booking
- Call a car to your location instantaneously

- Bill monthly
  - Flat unlimited use

Payment

- Public transport (trains and busses) free to public.
 - No app required
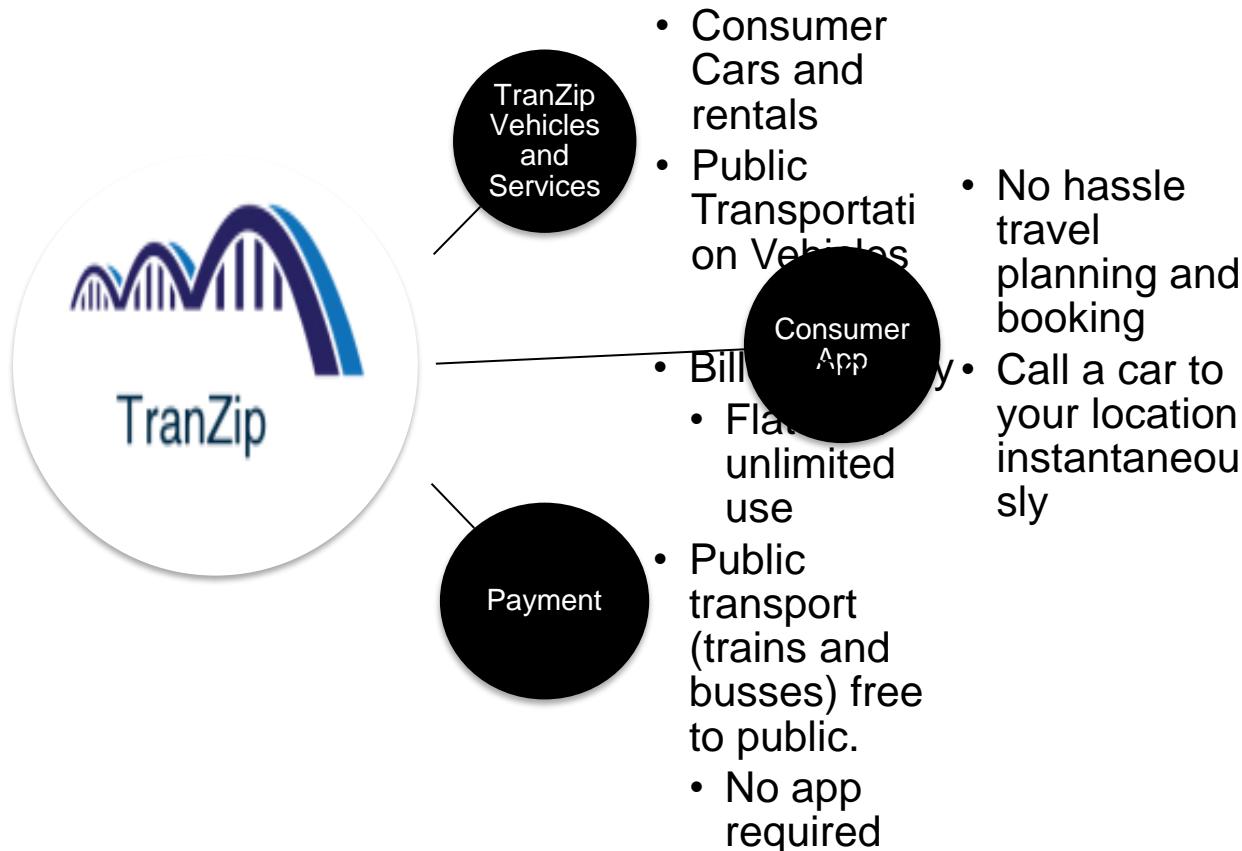
Critical Success Factors

- Funding: TranZip will secure constant cash flow by allowing people to subscribe to our service at a cheap, flat, monthly fee.

- Growth Campaign: TranZip will engage in an aggressive campaign of social media advertising, including YouTube, Twitter, and Facebook.

- Customer Service: We will allow people to rate our services based on criteria such as: timeliness of vehicle arrival, accuracy of pick-up location and drop-off location, and interior conditions of the vehicle.

- Service: We will offer customers a service that offers driverless transportation—something that no other competitor has done yet. It will also be accessible through a TranZip app that will allow a user to place "orders" on a vehicle and have it routed to their current location.

Competitive Analysis

TranZip

Uber

Users will not have to worry about belligerent drivers

Users can easily re-route their car to a different location through the app

Chances of unclean vehicles are lowered because the vehicles will be owned by Tranzip

Both will transport users to desired locations.

Both offer booking of rides through a mobile app

Allows users to interact with a human driver, but naturally increases chances of conflict.

Chances of unclean vehicle are heightened because the cars are not owned by Uber.

Strategic Uses of IT

- TranZip cars will allow users to choose nearby TranZip cars and can access images of them through an online database.

- TranZip cars come equipped with built-in GPS and offline maps. This will allow the cars to still be operable if real-time satellite information (traffic, accidents, hazards, etc.) are unavailable.

- TranZip can keep track of wear-and-tear on vehicles through built-in sensors that will alert TranZip of cars that may be on the verge of breaking down. This will prevent instances where TranZip cars become inoperable during a pick-up/drop-off.

- TranZip will keep every owned car in an online database. This database will feature real-time information of current mileage, current gas levels, current location, and current status (wear-and-tear).

Ethics

- TranZip's code of ethics focuses on providing the best possible services to customers without compromising our values.

- Ethical issues TranZip could potentially face include mistreatment of employees, disregard for the safety and opinions of customers, as well as compliance with safety regulations and other laws.

- Strict adherence to a code of ethics will help us develop a high level of trust with our customers, as well as establish TranZip's reputation of being a company with a commitment to ethical business practices.

Privacy

- TranZip holds privacy of the customer and the employee to the upmost importance.

- TranZip will enact strict privacy procedures to protect the customer and employee information on our databases and apps.

  - There will be specific passwords and firewalls for the databases, only a handful of employees will have access to.

  - There will be 2 step log ins on customer apps to protect the customer from unwanted users.

Security

Risk Management:

By sending cars out (autonomously) to pick up customers, we will be exposed to various dangers— among which are liability for accidents, threat of theft/vandalism, and being targets for cyber attacks. In lieu of these things, TranZip will protect itself in the following ways:

- TranZip will protect itself in the event of accidents by insuring all of its vehicles and requiring users to sign a Release of Liability waiver. On top of that, TranZip will constantly test and upgrade its driving software (and hardware when necessary) to minimize the chances of accidents.
- TranZip will implement various alarm systems which will automatically notify the police if the vehicle senses tampering or damage.
- TranZip will ensure that both passengers and their information are secure by installing firewalls and eliminating data-transferring USB ports from the vehicle. Not only that, but only the current destination's routing information will be stored locally in the vehicle's hard-drive to prevent the a hijacker stealing a user's personal information from a TranZip vehicle.

Exposure

- If certain information is lost, damages, or otherwise compromised, it could lead to drastic effects for both the customer and the business.
  - Customers can become vulnerable to financial harm: identity theft or fraudulent purchases:
    - Credit card information
    - Social security number, etc.
  - Customers can become vulnerable to physical harm:
    - Address
    - Car Malfunction
      - Car crash/Negligence of car care
  - The business will likely see legal repercussions:
    - Lawsuit
    - Loss of license
    - Loss of business/Tarnished reputation

Threats

- Threats to TranZip include both physical and online.
- Potential threats include the following:
  - Scammers hacking into the system to access employee and customer information. (credit card info, billing address, etc.)
  - Disgruntled employees who know passwords and company secrets may want to use the information against TranZip.
  - Malfunctioning cars can results as a threat to the customers. (computer malfunction, car break down, etc.)
  - New competition could begin and find out information about the company or steal customers.

Key Business Processes

- 1. Create Customer Account
- 2. Locate Customer
- 3. Locate Vehicle
- 4. Dispatch Vehicle

- 5. Pick up customer
- 6. Drop off customer
- 7. Charge customer
- 8. Vehicle Maintenance

Information Needs

- 1. Customer Account
- 2. Customer Pick-Up Location
- 3. Customer Payment Information
- 4. Payment method (one-

time/ subscription)
- 5. Customer Destination
- 6. Vehicle maintenance records
- 7. Vehicle database
- 8. Insurance
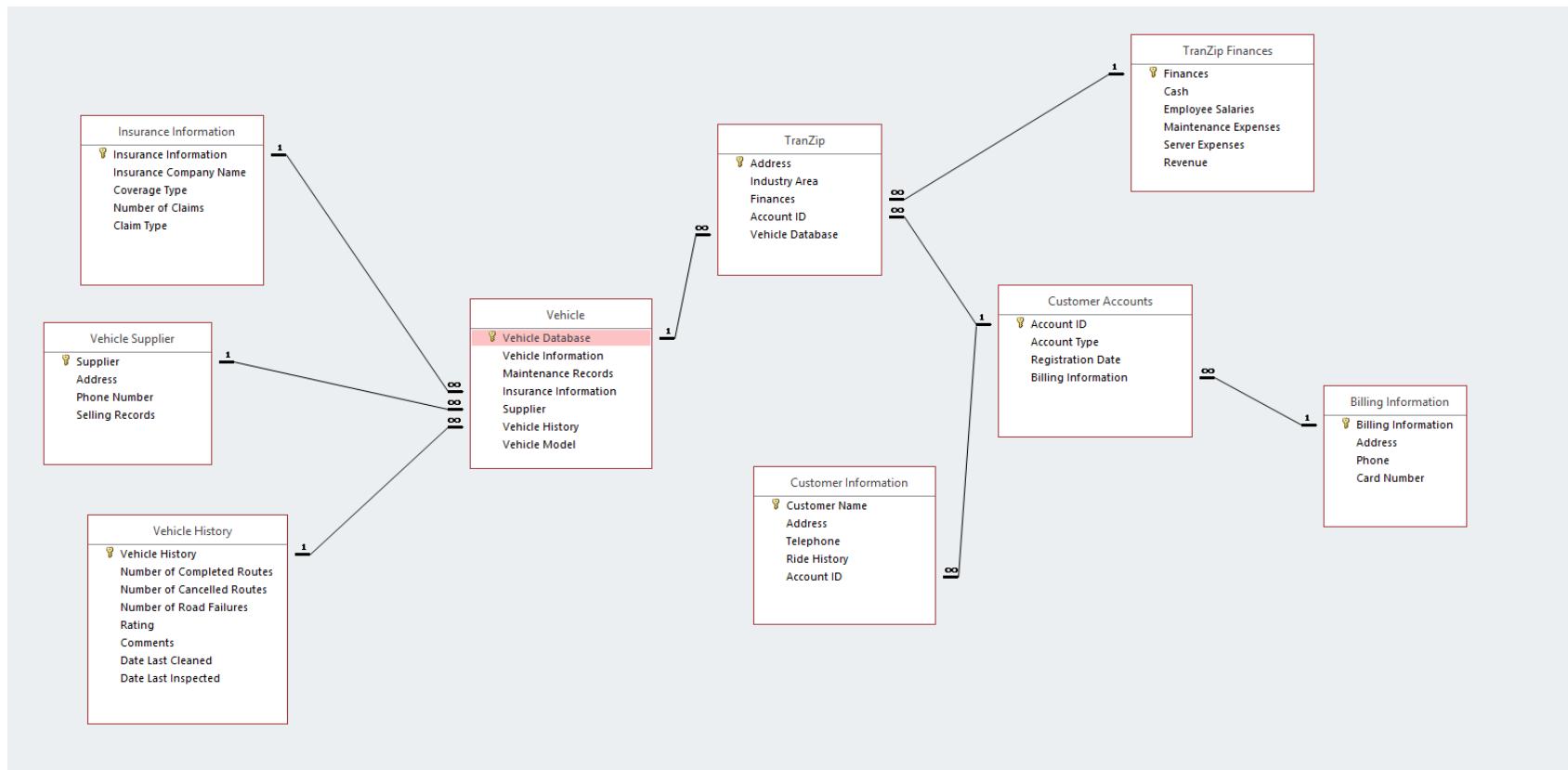
Web design diagram
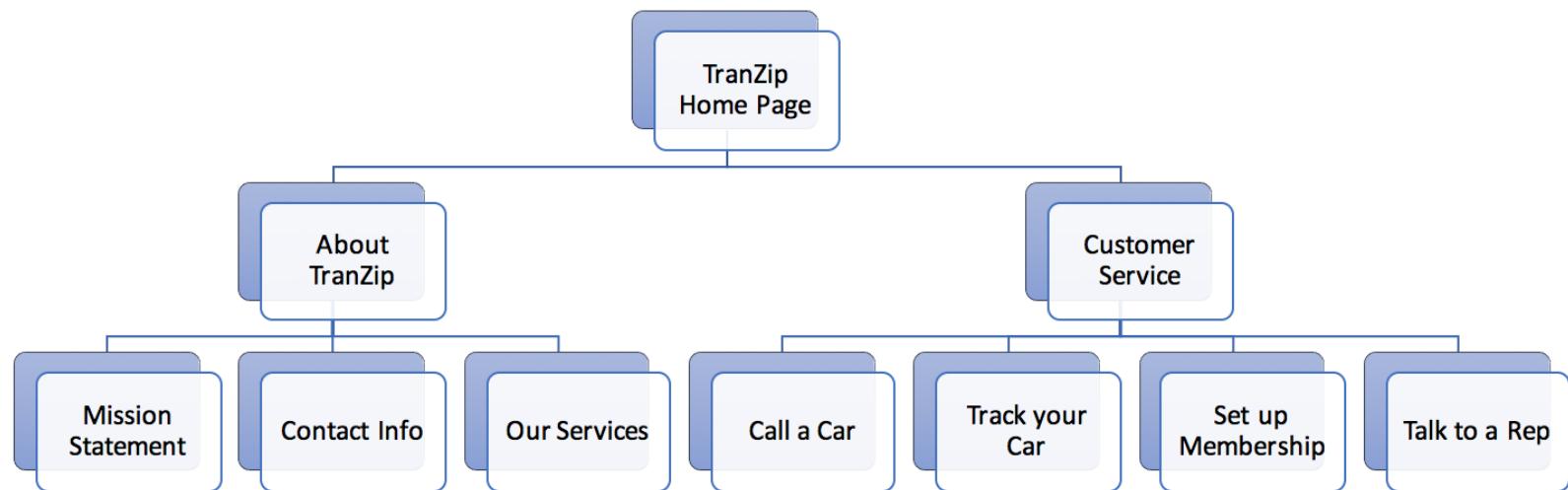
Planning Questions

- Q: How will you communicate your brand?
- A: Internet Searches, Facebook Ads, YouTube Ads, and Twitter shout-outs.
- Q: What content will make this site unique and attractive?
- A: Ability to estimate fare costs, free ride-credit raffles, and trivia events to earn rewards like free subscriptions or ride-credits
- Q: What will keep visitors coming back?
- A: Discounts, Convenience, and Simplicity
- Q: What sort of interactive content does the site need?
- A: Maps that can access GPS information in real-time
- Q: Should the site include some form of entertainment to keep people interested?
- A: Aside from trivia events and raffles, not really. Games would likely be ineffective and videos would probably be a turn-off for visitors.
- Q: Should a "community" be built through message boards, memberships, chat areas, and special interest areas?
- A: Not publically, no. This is because the service we are providing is based on a quid-pro-quo relationship with the user. In other words, after the user has received the ride, there is little reason for them to contact us again unless they wish to get another ride. However, a message-board for drivers could be applicable because they are constantly involved with our operations.

Use of wireless technology

- TranZip has a mobile site and free app, which enable customers to easily book rides, track their vehicles, and update their information quickly.

- The TranZip app can be used on Apple, Android, and Google mobile phones

- Our website and app give TranZip customers the convenient option to use our ride-hailing services from any place in the U.S., on any wireless device

- Our secure wireless electronic payment system also allows customers to pay for rides and membership fees with whatever payment method they choose

TPS Specifications

- Transaction Processing System: Tranzip will use source data automation to facilitate exchanges between TranZip, customers, vehicle suppliers, and insurance companies. Online Transaction Processing will be used most heavily in regards to TranZip/Customer interactions .

- Management Information Systems: MIS will find itself useful in several areas of our business. Although similar to other areas of data analysis, the way MIS will use collected data to deduce and derive strategic advantages in the way we run our business. This involves optimizing the operations of TranZip in such a way that components of our business are able to both be tightly integrated, yet swift and efficient.

Specifications

- TranZip will utilize enterprise resource planning (ERP) to enable that our planning, management, and use of all resources are tightly integrated, which is essential because the company is new. For TranZip this would help us determine if a problem with our finances is linked to an error in sales and marketing, processes, manufacturing and production processes, or human resource processes.

- Sales force Automation (SFA) will be web enabled. TranZip's SFA will be delivered through smartphones, laptops, and tablets. TranZip will use this for customers through order tracking. TranZip will also use this for the company through contact management inventory monitoring and control, employee performance evaluation, and sales forecast analysis.

Specifications

- Customer Relationship Management: TranZip will engage in CRM for the purposes of securing loyalty from customers. Through a web-enabled rating and feedback service, we will allow our employees to interact directly with customers on both public (Twitter and Facebook, for example) and private (TranZip Customer Service hotline) platforms.

- Supply Chain Management: Tranzip will apply supply chain management by coordinating with the automobile manufacturers and transportation companies that supply our vehicles. We can increase the efficiency of this system by establishing an inter-organizational information system. This will reduce the time, risk, and cost of supplying our services to customers.

- Electronic Data Interchange: We will use a form of EDI to communicate customer "orders" from their mobile device to our server, and then from our server to the designated vehicle for pickup.

- Extranets: Extranets will allow TranZip to coordinate intimately with our vehicle manufacturers and help to foster collaboration.

Decision support needs

- We at TranZip would need the Decision Support System (DSS) for our cars. We would use the DSS to come up with the quickest routes for our car in an instant. The DSS would automatically process the route, and if there is a problem along the way, DSS would kick in again and find an alternate route. DSS will also asses our risk of our car breaking down, if it doesn't make it to the destination, etc. Lastly, DSS would collect data and information to decide where our cars will circulate, how many cars we would need in each city, and if we would need to stop utilizing cars in a specific area.

Decision support needs

- We at TranZip would use Executive Support Systems (ESS) for our chief officers to make executive decisions. For example, the ESS would help our officers know what is going on in certain areas and to do something about it. TranZip executives would also use this to survey if we have reached our goals of number of rides provided and allow them to assess managers.

- TranZip will utilize Group Decision Support Systems (GDSS) to help make group decisions in regional areas. For example, managers and employees may need to vote on where to get the cars serviced, how to promote TranZip in that area, or how to handle an emergency.