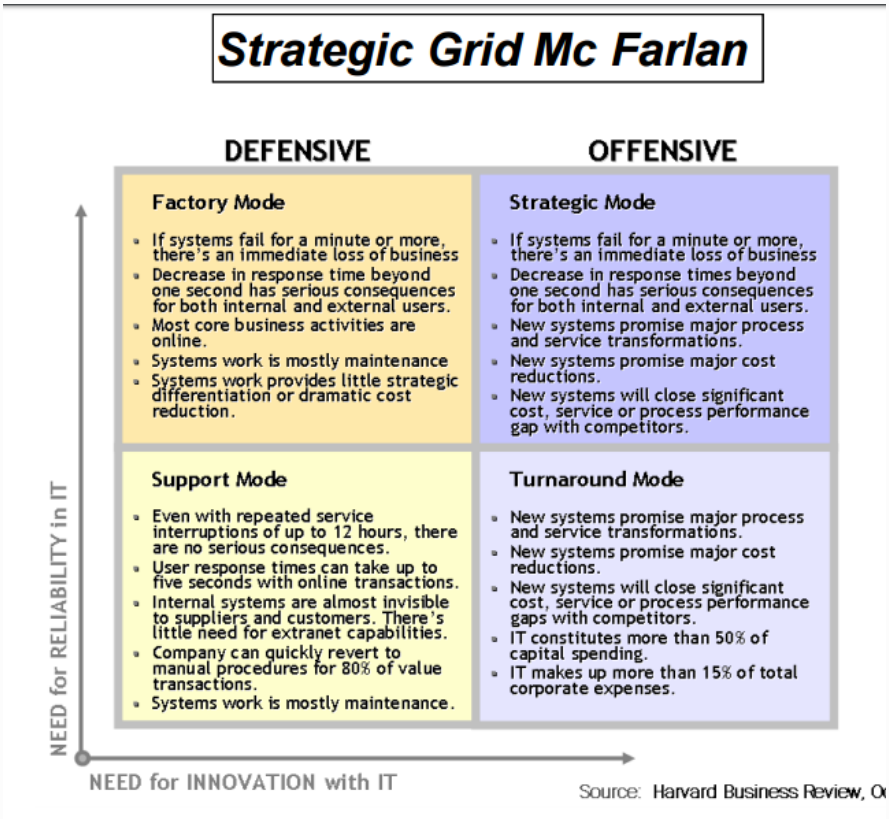
HC3 ICTSM

- EXAMEN!!!



- To understand best practices
- Vertical: How important is ICT today? → dependency (low → support)
- Horizontal: How can ICT change the business
- Defensive: how much the company relies on cost-effective, uninterrupted, secure, smoothly operating technology systems (operational reliability)
- Offensive: how much the company relies on IT for its competitive edge through systems that provide new value-added services and products or high responsiveness to customers. Offensive IT projects tend to be ambitious and risky because they often involve substantial organizational change
- **The four modes:**
    - **support Mode**: e.g. e-commerce , cement factory
        - relatively low need for reliability and a low need for strategic IT
        - technology fundamentally exists to support employees' activities
        - the ICT function should concentrate on technical skills, and have a clear service orientation for the rest of the business. It is typically organized in a "hands-on" fashion. The biggest danger for an ICT function of this type is that it may readily be outsourced.
    - **Factory Mode**: company is dependent on ICT (fails without) e.g. production companies
        - highly reliable systems but don't really require state-of-the-art computing
        - These companies are much more dependent on the smooth operation of their technology, since most of their core business systems are online. They suffer an immediate loss of business if systems fail even for a minute
        - the board needs to make sure that disaster recovery and security procedures are in place

    - term factory is not an accident, as many advanced industrial activities that use computer integrated manufacturing and quality control find ICT in this function. Think of a typical steel company today, as an example.
- **Strategic Mode**: e.g. bank & insurance companies (risk management)
    - New technology informs not only the way they approach the marketplace but also the way they carry out daily operations.
    - Strategic-mode firms need as much reliability as factory-mode firms do, but they also aggressively pursue process and service opportunities, cost reductions, and competitive advantages.
    - Like turnaround firms, their IT expenditures are large.
    - Not every firm wants or needs to be in this mode; some are forced into it by competitive pressures.
- **Turnaround Mode**: e.g. developing new things for the car industry
    - technology typically accounts for more than 50% of capital expenditures and more than 15% of corporate costs
    - companies in this mode have a comparatively low need for reliability when it comes to existing business systems; like companies in support mode, they can withstand repeated service interruptions of up to 12 hours without serious consequences, and core business activities remain on a batch cycle
    - Companies usually enter turnaround mode with a major IT project that requires a big reengineering effort, often accompanied by the decision to outsource or move a substantial portion of their operations offshore.
    - Most firms don't spend a long time in turnaround mode; once the change is made, they move into either factory mode or strategic mode.
    - when an organization that has no critical dependence on current ICT suddenly find itself in a situation where new opportunities for ICT applications arise. An example might be a publisher, who finds the Internet to be danger, but at the same time an opportunity for him.
    - ICT should clearly have a visionary orientation in this function. It must concentrate on business knowledge and creativity, and be influential to the overall management of the organization.
- → Firms that require a high level of reliability need to focus on managing IT risk. The job of these boards is to assure the completeness, quality, security, reliability, and maintenance of existing IT investments that support day-to-day business processes
- Watch out for :
    - Inventory the assets (all modes)
    - Assure security and reliability (factory and strategic modes).
    - Avoid surprises (factory, turnaround, and strategic modes)
    - Watch out for legal problems (turnaround and strategic modes).
    - Keep an eye out for fresh threats and opportunities (turnaround and strategic modes)
- Slide 3: Mc. Farlan is typically used for positioning strategic investments in ICT applications. It explains also how time is playing a role in strategic uses of ICT. "Winners" make a move through the right side of this grid, while "Losers", the ones that fall behind in time, are forced to move directly to go from a support to a factory situation, without incurring the benefits of strategic opportunities of ICT. The following explains the mechanism.

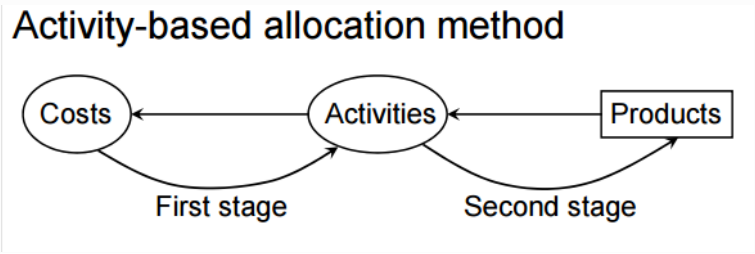
- **Cost-based accounting** : non-profit (break-even) → you recover your cost → the costs

of the service center are accounted, without making profit. The users of the service center are charged for the services, using a variety of cost distribution techniques, such as average pricing, differential pricing, or other models which will be discussed later. The prices are based on the actual costs.

- **Hybrid accounting**: cost functions → how to deal with the recovery of cost? Depends on how you use ICT as services → the other approaches are combined
- **Profit-based accounting**: will you accept a profit → hereby the service centre is considered as an independent company, which is fully responsible for its own profitability. Again the users are charged for the services, but the pricing is completely driven by a market mechanism.
- **Overhead-based accounting**: everyone is paying → the users are not charged for the services, and the services are considered as an overhead for the community of the users. In fact, implicitly the users always pay, since the services are paid by considering them as overhead in the budget. Recent developments in accounting stimulate the overhead-based approaches still to use some charging mechanisms, such as **activity-based costing.**

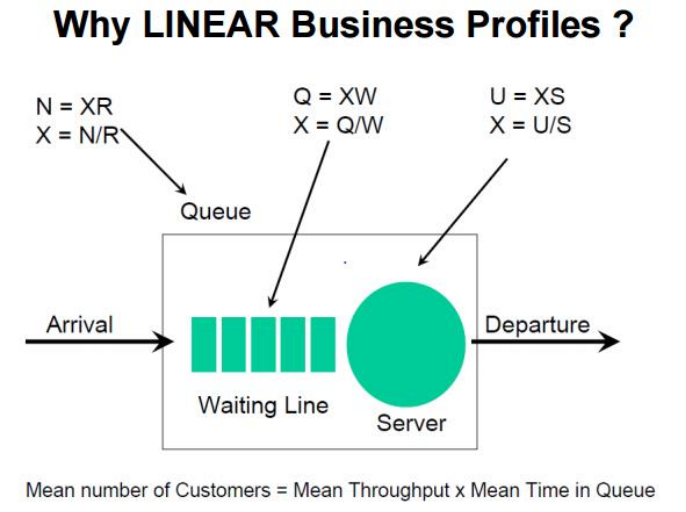
- Slide 5 – 8
  - Optimum MC = MV
  - No internal profits! → be careful with internal profit, it will always consume something of the total profit of the organization → always some profit lost. Solution: make IT department external organization & negotiate.

- Slide 9 – 10 THE ABC PROCESS



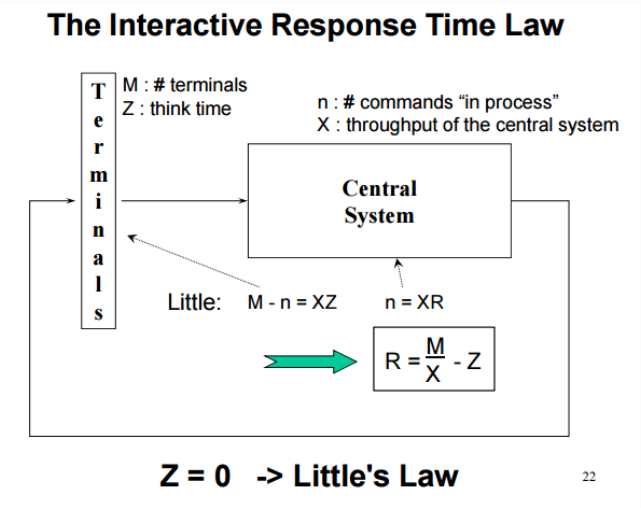
  - Allocate costs first to activities and next to products.
  - **ABC** tries to identify the activities that are the actual cost "drivers", and next identifies the resource-consumption of these activities to find an analytical description that explains how much and why some resources are used by some activities. One of the benefits of ABC is its ability to make cost structures more transparent also to non-financial managers, stimulating them for optimization and continuous improvement.
  - A **general ledger** (grootboek) contains all the accounts for recording transactions relating to a company's assets, liabilities, owners' equity, revenue, and expenses.
  - How are activities using resources?
  - Define cost objects → A cost object is any item for which costs are being separately measured. It is a key concept used in managing the costs of a business.
  - ICT : based on LINEAIR cost functions
- Slide 11 - 14
  - Columns = activities
  - Structure of cost/production functions → translations between columns
  - Every service is completely unique → bundle of technology, resources & assets
  - How do the business activities relate to the service activities?
  - Service activities: e.g. push the button → interaction between human & machine (short & long) to start the service (e.g. long → batch service activities)
  - TRA activities:
    - Time-time oriented: e.g. process time, access time,..
    - Space-oriented: e.g. vierkantemeter,…
  - Business profile: transaction between user; translates business into service
  - Service profile: here they will negotiate with ICT
  - Cost functions: mapping across the columns (=profile) → only take neighbor columns to create new column (→ profile = production function)
  - User should not know what goes on behind the service (interaction point)
- Example government tax services slide 16 - 17
  - Example of mapping
  - Columns : service activities
  - Rows: business activities ! not every row has a cross in a column!
  - Slide 17: how ICT components are working together (red zone : danger zone → problems are too difficult to solve in here)
- Slide 18: e.g. Avg size of image files retrieved → now it is a service but to let it be a business it needs to be well formulized (otherwise it is a service)

- Slide 20 QUEUEING SYSTEMS:

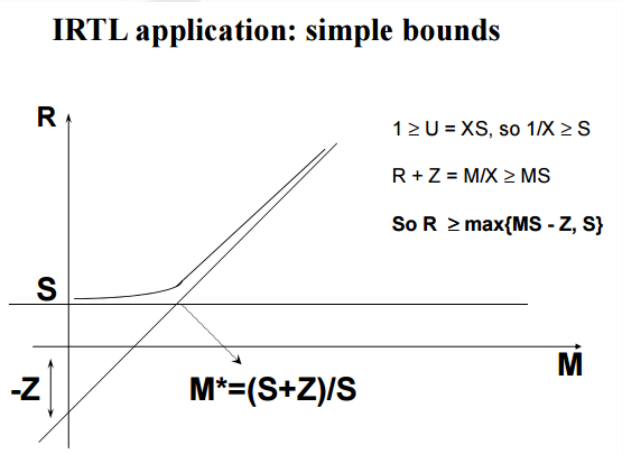


  - S = service time (e.g. 20 seconds)
  - X = throughput (e.g. 2 transactions/minute)
  - N = Mean customers waiting
  - W = Mean time in queue (waiting time)
  - U = Utilization (< = 100%)
  - R = Response time (vaak vastgelegd door service level agreements)
  - Q = Mean number of Customers
  - **Queue** represents a certain number of customers waiting for service (of course the queue may be empty). Typically the customer being served is considered not to be in the queue. Sometimes the customers form a queue literally (people waiting in a line for a bank teller). Sometimes the queue is an abstraction (planes waiting for a runway to land). There are two important properties of a queue: *Maximum Size* and *Queuing Discipline*.
  - **Arrival** defines the way customers enter the system. Mostly the arrivals are random with random intervals between two adjacent arrivals. Typically the arrival is described by a random distribution of intervals also called *Arrival Pattern*.
  - **Waiting Line**
  - **Server** represents some activity that takes time and that the customers are waiting for. Again take it very generally. It may be a real service carried on persons or machines, but it may be a CPU time slice, connection created for a telephone call, being shot down for an enemy plane, etc. Typically a service takes random time.
  - **Departure** represents the way customers leave the system. Output is mostly ignored by theoretical models, but sometimes the customers leaving the server enter the queue again ("round robin" time-sharing systems).

- The interactive Response Time Law (slide 22)



  - Z = 0 → Little's Law → estimate of average numbers in the queue (without think time = batch producing)
  - Terminals → work stations
  - R = response time → the turnaround time for a service transaction (negative R is not possible and above 5 seconds people get nervous)
  - these performance laws indicate a linear functional relationship between the business units (M) and the service units (X) → This is already a first indicator that shows how Service Level Agreements act as a boundary value to fix the relation between the Business activities and the Service activities (hence establishing Alignment between these two types of activities).
  - In service profiles that contain space-time related work units, linear functions can again be used, although there may be a fixed cost involved.
- IRTL application: simple bounds (slide 24)
  - S = saturation point where the economy is changing
  - There is also a bound for the throughput (= revenue)
  - How a computer system is behaving
  - very often the response time is bounded by a Service Level Agreement (SLA) which gives an upper bound to the response times of services.



- Slide 27 : Is revenue always coming from the throughput? Most of the time (or response time but never together) . You can only answer which one is the best if you have agreed on the service level!
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- Service Profiles may be more complex! (slide 30)
  - **Rules of thumb:** e.g. you can on average never use a processor for more than 90% → can be imprecise & intuitive, easy & cheap.

- **Analytical Performance Models**: e.g. Stochastic models → A stochastic model is a tool for estimating probability distributions of potential outcomes by allowing for random variation in one or more inputs over time.
- **Simulation Models**
- **Benchmarking**

(The time-oriented service profiles are also linear production functions. The fact that these profiles are in practice mostly linear production functions is caused by some fundamental laws of computer performance and capacity planning)

- FORCED FLOW LAW (slide 32)
  - states that every workload unit is related in a linear way to resource consumptions by means of so-called "visit ratio's", which are in fact the service profiles for this case

Forced Flow Law

By definition of the average number of visits V_i, each completing request has to pass V_i times, on the average, by queue *i*. So, if X_o requests complete per unit of time, $V_i * X_o$ requests will visit queue *i*.

$$X_i = V_i * X_o$$

- Analytical planning for ICT-resources (slide 34)
  - The starting point for a capacity planning may typically be a business plan, which is nothing but a forecast of the planned number of business units, for each business activity. By means of the business profiles, the business unit forecast can be translated into a forecast for the service activities, giving for each service activity the required numbers of service units that must be planned for. Next by means of the service profiles a translation is possible in terms of the required numbers of work units for each resource type, now and in the future. This is precisely the information that is needed for capacity planners to estimate the dimensions of the resources and the configurations that are sufficient to provide the required number of work units.
- Slide 44 :
  - Service profile → fixed costs
  - Business profile → no fixed costs