Management Principles for Computing Professionals

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Frederick Taylor: scientific management. Benefits to employees: Quantifying tasks and jobs. Clarifies roles and responsibilities. Measurements and objectives are clear.

Time and motion studies: determining impact of equipment and environment on productivity (ergonomics)

Elton Mayo: Hawthorne effect/studies – employer care has a positive impact on employee productivity. (Morale, etc)

“Informercial approach”: short-term gains driven by the Hawthorne effect; theory demonstrates exclusivity; techniques are not often studied or confirmed from a scientific perspective (independent double-blind studies)

Metrics of Organizational Performance

* Revenue
* Profit $/margin
* Efficiency ($ profit/employee)
* Employee morale/attrition
* Customer satisfaction
* Year-over-year consistency and growth
* Market share
* Goals/deadlines met
* Sector leader
* On or under budget
* Count of customers/people helped
* Social impact and influence/brand recognition
* Employee benefits/pay
* Patent count
* Number of products in the pipeline
* R&D budget size
* Product quality

Standish Groups CHAOS Study (2004): how many startups succeed?

18% startup failure

53% partial success

29% success

Where success is on time/on budget/met customer needs

Steve McConnell – Construx: classical mistake categories of software startups (most are management-controllable)

* Process-related: 14
* People-related: 13
* Project-related: 5
* Technology-related: 4

1. Management/business principles
   1. Human Relations
      1. Teams
         1. Creating
         2. managing
         3. Collaboration/Communication
      2. Motivation
      3. Leadership
      4. Dcecision-making
      5. Innovation, fostering and definition
      6. Organizational Culture
2. Psychology (individual and group)
3. Sociology/Anthropology
4. Software Engineering

Organizations & Individuals

Ed Schein – MIT Sloan School of Management

The Sociology of Organizational Culture –culture shows adaptation to external pressures. Founders/leaders/visionaries establish a culture. National culture also plays a role.

Cultural model of organizations

* Ring 3 (most visible): Logos/brands/slogans/brochures/websites
* Ring 2 (less visible) Heros - ccasionally move into ring 3
* Ring 1: Rites and ceremonies
* Ring 0: Core institutional values

Individual values: independent initiative; personal satisfaction; personal life goals; independence; work/life balance; benefits

Organizational values: accomplishment of group goals; statistics/mass opinion/public perception; retention

Goal congruency: positive correlation between overlap of individual and organizational goals and job satisfaction.

High: low absenteeism, attrition, high productivity and advancement

Low: High absenteeism and attrition; low productivity

Perpetuating organizational culture: rites/ceremonies/meetings/reorgs/reaction to stress/job rotation/training/incentives/disincentives

Organizations possess significant inertia; difficult to change; can take years (fighting habits, old patterns that used to work, personal investment, and management turf, FUD)

10/7/2008:

Deloitte and Touche review:

Effective cultural change:

* From the top
* Justify the business case
* Make it public and visible
* Track progress with metrics and hold people accountability
* Identify barriers
* Training, education, and seminars
* Policy changes (reward change)
* Respond directly to issues
* patience: change takes years
* Identify subcultures who are ready to change
* Changes may benefit other areas
* Use outside assistance for evaluation, planning, and implementation

Individual traits and skills:

* Crystallized intelligence (g sub c) (Gc):Memorization/book knowledge/facts)
* Fluid intelligence (g sub f) (Gf): New idea synthesis and creation; intuition; problem-solving; requirements and constraints; logic problems; lateral thinking
* Tacit knowledge: street smarts; real-world knowledge; how to work in specific situations; challenge-based questions
* Organizational knowledge: politics
* Emotional Intelligence
  + Reuven Bar-On: emotional intelligence as a predictor of success, 1985 Israel
  + Daniel Goldman: popularized it
  + Understanding impact of emotions on self and others
  + Understanding emotional interactions
  + Maturity/self-awareness
  + Dealing with people
* Experience
  + Breadth and depth
  + Time-in-service
  + Diversity
  + Continuity
* Stress
  + Eustress AKA “good stress”; positive non-damaging, productivity-enhancing pressure
    - Carrot or stick; deadlines; realistic goals
  + Distress: “bad stress”; negative, damaging
  + Type A: workaholic competitive; in distress
  + Type B: work/life balance, likes sports and leisure
  + Type H: overstressed hostile; mentally unstable

10/9/2008

Individuals in an organization

* Job satisfaction/morale
* Job performance
* Communication
* Conflict
* Team performance
* Attrition
* Hiring process
  + Understand the needs (role/job responsibilities; needed skills; reporting structure; team and culture; salary and infrastructure costs)
  + Salaries: job websites, labor databases
  + Creating and advertising a job description
  + Getting (headhunter/recruiting) and evaluating resumes
  + Initial reduction of candidate resume pool
  + Initial screen/tech screen (is person real and sane and capable) sometimes timed
  + In-person interviews (is there a fit?); goal congruency; all-day, multiday; usually 1:1;
  + Team interviews – different approaches, stresses, observations, input, good training opportunity
  + Building tour – chance to observe the candidate and show off the facilities
  + Legal – no personal stuff
  + Make a decision (team consensus, quick, decided by hiring manager)
  + Background checks/references
  + Make an offer
  + Employment contract (NDA, non-compete clauses; “work for hire” IP agreements/copyrights/patents; conflict of interest
  + Ethics
  + Onboarding
    - NEO/hr/legal/team introductions/mentoring
    - Apprenticeship/limited contract

10/14/2008

Quinn/Cameron, 1980s - lifecycle of organizations – introduction; growth; maturity; decline/renewal. Organizations that can renew their successes into new businesses will be long-term successful.

Leadership styles, organizational structure, innovation, and policies and procedures

Richard Daft – Organizational lifecycle

Structure, products/services, reward/control, innovation, primary organizational goal, top management style

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| --- | --- | --- | --- | --- | --- |
|  | **Entreprenurial** | **Collectivity** | **Formalization** | **Elaboration** |  |
| **Structure** | Informal | Mostly informal, w/ policies and procedures | Formal policies / procedures / division of labor (Taylorism) | Teamwork / bureaucracy / small-company thinking |  |
| **Products/services** | One | One, with variations | Related products / services | Multiple product / service lines |  |
| **Reward/control** | Personal/Paternalistic | Personal, and rewarding contributions to success | Impersonal / formalized | Extensive and tailored to products and services |  |
| **Innovation** | Owner/manager/founder | Employees + management | Formal R&D | Institutionalized R&D |  |
| **Primary Organizational goal** | Survival | Growth | Internal stability and expansion | Reputation |  |
| **Top Mgmt Style** | Individual | Charismatic with direction given | Delegation, but with control | Team Approach / Attack Bureaucracy |  |

Rensis Likert – Organization Classified Leadership Style

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type** | **1** | **2** | **3** | **4** |
|  | Exploitative/autocratic (v small) | Benevolent Autocratic (small – medium) | Consultative – (small – large) | Democratic |
|  | Commodity / profit / assembly line / repetitive / strong oversight and supervision | Bottom-line decision-maker, less oversight | Key decision maker but informed by individual input; committee input | Consensus-drive, self-governing |

10/16/2008

Management and control structures - form follows function – take the structure that’s most efficient

* Simple/informal: ill-defined job profile, consensus decision-making, slow, inefficient, doesn’t scale
* Flat: one person in charge, with little organized hierarchy below
* Hierarchical: standard command and control
* Matrix: PMs owning, and reporting to, multiple projects at the same time
  + Improves communication and agility by removing layers of middle management

Teams and groups

|  |  |
| --- | --- |
| **Working groups** | **High-performance teams** |
| Individual: effort/goals/rewards/decision-making | Collaborative: common goals/team incentives/decision-making |
| Focused effort/goals | Broader scope/general goals |
|  | Members selected for potential as well as skill |
| Work-focused; not dependent on team chemistry | Social with each other outside of work / good chemistry / trust |
| Individuals stay within their well-defined roles | Individuals step outside their fluid role to meet a team need |
| Short-term and/or intermittent | Long-term and continuous |
|  | Lifespan of 1-3 years |
| Flat/committee structure | Shared leadership |

Teams and individuals:

* Group roles – need some task-related and maintenance roles to succeed
  + Task-related – accomplish the goals (planner, organizer, leader, evaluator, analyzer)
  + Maintenance-related – forming and maintaining the team (facilitator, mediator, communicator, observer, cheerleader, reconciler)
  + Individual – self vs. team (player, aggressor, blocker, self-server, criticizor, back-stabber)

Team/group challenges

* group-think – don’t challenge ideas; new solutions discouraged
* Risky shift (group polarization) – willingness to advocate risky positions in a group – social influence and assumptions about others’ positions forces polarization

Managing teams/groups

* Define team goals
  + Charter and reason for existence
  + Scope of responsibility and authority
  + Timeframe and resources
  + Team rewards/team-oriented
* Understand team purpose
  + Recommend things
  + Make/do/build things
  + Run things
* Consider team size
  + Complexity of information – effective team size is from 2 - 25
* Team membership
  + Technical/functional vs business
  + Problem-solving vs decision-making
  + Interpersonal skills and emotional intelligence
  + Lack of a specific skill is not necessarily a detriment – can provide growth opportunity
* Team success
  + First meetings are critical to establish framework and team member relationships
  + Comraderie-building happens as team spends time together
  + Resolve personnel issues quickly and fairly
  + Set goals and define rewards

10/21/2008

Communications - problems

* Conveying info in a timely manner
* Impact on inter-team relationships and teamwork
* Impact of communication modes and new technologies
* Impact on re-work (requirements gathering)
* Poor and incorrect decision-making
* Impact on intra and inter-team relations
* “Arc of distortion”: data lost between sender and receiver, caused by physical distance, technology differences, language problems, cultural differences, personality differences, expectations, and stereotypes/filtering

Modes of communication: oral/written/listening/non-verbal/posture/eye contact/touching/personal space

Comparative management:

Lkuckohohn-Strodbeck model: 6 dimensions

1. Relationship to environment: subjugation, in harmony, domination
2. Time orientation: past, present, future
3. nature of people: good/evil/mix
4. Activity orientation: being, doing, controlling
5. Focus of responsibility: individual, hierarchical, groups
6. Concept of space: private, public, mix

Hofstade model: 4 dimensions

* Power Distance
* Individualism vs. collectivism
* Masculinity vs. femininity
* Uncertainty avoidance

Improving communication

* Training (active listening/personal/interpersonal relationships/EI/team-building/cultural awareness)
* Select appropriate mode (in-person, etc, to read non-verbal
* Understand individual impact
* Active listening – paraphrasing, action items, meeting minutes
* When forming a team: establish mentorships

10/23/2008

Structured interviewing – one way to fight the “New Boy Network” effect of liking making snap hiring decisions.

Corrective feedback: managing communication-related personnel issues

* Provide feedback to the appropriate parties regarding communications issues
* Feedback comes from respected/trusted source
* Useful, specific, actionable (SMART)
* Written action plan acknowledged by recipient

Personality Traits andStates

* Traits are part of self (genetics?)
* Long-lasting and difficult to change, takes energy and effort, easy to backslide
* States are conditional and based on current conditions
* Based on learned responses; how we deal with our environment
* Different conditions yield different states

Attribution of success/failure

Self: success: attributed to internal causes; failure: attributed to external causes

Others: success: attributed to external causes (luck, genetics); failure: attributed to internal causes

Basics of motivation

Needs -> Drive (motive -> Incentive

* Needs: incur a physiological or psychological imbalance
* Recognize/understand/classify it

Drive

* Needs are translated into actions orientated to overcome the imbalance
* Energizes you to an incentive

Incentive

* Will alleviate the need and restore the balance

Motives

* Primary – must be instinctive and physiologically based (food, water, sleep, sex, shelter)
* General/”human” motives – curiosity, activity, affection/affiliation
* Secondary – need for achievement

Content Theories of Motivation: A satisfied need no longer motivates; basic needs are higher priority; needs are interconnected

David McClelland –Theory of needs:

need for achievement, affection, power, security, status

Christina Morgan/ Henry Murray - Thematic Appreciation Test :

Ask users to add emotional context to a neutral image

Maslow’s hierarchy

Alderfer’s ERG theory – Existence (physiological), Relatedness (social and external esteem), Growth (self-actualization)

Two-factor theory/Herzberg Motivation/Hygiene Theory – separate factors that cause satisfaction (nature of the work) and dissatisfaction (environmental factors)

Process Theories of Motivation: Quantify relative strength of motivators.

Performance = f(capability (Gc,Gf, Tacit, EI, Experience) \* opportunity \* motivation)

Victor Vroom – Expectancy Theory:

individuals have different sets of goals and can be motivated:

Motivational force = expectancy \* instrumentality \* valence force.

Expectancy –probability of effort leading to positive outcome: 0 to 1

Instrumentality – probability of effort being rewarded: 0 – 1

Valence: personal value of the reward: negative to positive infinity

John Stacy Adams - Equity Theory:

Job equity: The motivational effect of one’s perception of one’s own input/output ratio compared to peers

O-sub-I / I-sub-I == O-sub-o/I-sub-o

Perceived inequity -> tension within individual -> motivation to resolve tension -> results in action

**JCM** - Job Characteristics Model: task characteristics cause psychological states that result in outcomes.

Characteristics: skill variety, ownership (identity), significance, autonomy, feedback

States: meaningfulness/personal responsibility

Outcomes: high output/motivation/satisfaction

Work satisfaction: factors range from internal traits to external states

Improving a job (job design): enlargement, enrichment, sharing, full picture, good boss

Steve McConnell: COCOMO 2: 15 variables that have an impact on project outcome. 10 are organizational.

Leadership is strategic, management is tactical

Leadership roles: interpersonal, informational, decisional

Characteristics: honesty, visionary, inspiring, competent

Feudal: autocratic, birthright, easy rule change, nepotism

Bureaucratic: hierarchical, clear rules, merit-based reward

“Great Man Theory”: natural leadership shows up in 11% of the population

“Common Trait”: Bass and Stogdill’s handbook: identifiable leadership traits

Douglas MacGregor: X-theory/Y-theory

X-Theory: Tasks, details, efficiency, time and motion, extroverted

Autocratic (pessimistic, workers are lazy/dumb) and

Y-Theory: people, sensitive, democratic, morale, slow, introverted

Participative (optimistic, workers are self-motivating seek self-actualization) style

Behavior Leadership Theories (Ohio State/U of Michigan): Leaders can be made

Robert Blake and June Mouton - Managerial Grid: concern for people vs. production

11/25/2008

Fred Fiedler – Contingency Theory of Leadership: Anyone can be a leader.

Leaders can modify their level of task structure and relationship interactions to optimize team performance. Measure it in absenteeism.

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Know your trait: Task-oriented vs. Relationship oriented

Know your situation.

Situational Control Factors:

Leadership: modify leader-member relations: informal time, social activities, availability

Task structure: toggle line-item scheduling, process level

Position power: modulate authority, delegate

Strube and Garcia –validated Fiedler’s theory

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Situational Leadership –Hersey, Paul and Blanchard, Kenneth

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level of control decreases as buy-off increases

telling -> selling -> coaching -> delegating

Assumes an experienced leader

supportive behavior:

task behavior:

follower readiness:

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Factors of Leadership – Bass Studies

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Transformational leadership: 1, 3, 5 (relationship-oriented)

Transactional leadership: 2, 4 (task-oriented)

1. Charismatic leadership - charm/grace/self-belief
2. Contingent Reward
3. Individualized Considerations
4. Management By Exception
5. Intellectual Stimulation

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Decision-making – draw concentric circles in this order, small to large

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Ideal: careful cost/benefit analysis, probability of success of all alternatives.

Bounded Rationality: bound solution based on experience and then decide

Satisficing - Herbert Simon – non-controversial solution

Limited Search – speed is the focus

Worse choice - dartboard

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Problem-solving

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Divergent: expanding understanding

Convergent: making choices

Techniques:

Brainstorming

Fishbone diagram

Topic mapping

SWOT: Strengths, Weaknesses, Opportunities, Threats

Cause/effect

Chit voting

Pareto Analysis – analyzing trends

Victor Vroom and Phillip Yetton - Normative Model of decision-making

Participation increases decision acceptance.

Decision acceptance increases commitment and effectiveness of action.

Approaches:

A sub I: Autocratic

A sub II: Autocratic with input

C sub I: Consultative with individual input (1:1s)

C sub II: Consultative with group input (1:manys)

G sub II: democratic

Factors:

Decision quality

Information availability

Structure of situation

Commitment of others

Commitment of others without participation

goal congruency

conflict around alternatives

time

Tradeoffs:

Draw a triangle: Time/Cost/Quality

Quality of decision-making:

Effectiveness = quality + acceptance – time pressure

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Technology life cycle: hype, growth, maturity, saturation

Conflict:

A-type: Bad: Affective-type: emotional and personal; competitive.

C-type: Good: Cognitive-type: logical/unemotional, data-driven

Negotiation:

Principled: consensus

Theory W (win/win)

BATNA: reserve price. Best alternative to a negotiated agreement.

Hofstede: cultural factors

HR:

Coaching vs. mentoring

IC vs. Management track

Review process – fair and transparent

Change

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Establish need

Make managers aware

Diagnosis/information-gathering

Analysis

Synthesis – the plan

Social and systems change – the implementation

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force-field model analysis: catalog, stack rank, and diagram the forces for and against change

unobtrusive measures assessment: count cans to assess soda preference

Overcoming resistance

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Participation

Behavior modification

Mandate change

Time allowance

Peer pressure

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Organizational assessment – requirements elicitation

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360 – feedback from both peers and management

surveys/questionnaires

interviews

sensing – organization tours

polling

collage

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Union:

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Closed shop vs. Open shop

Taft-Hartley act: enables states to establish right-to-work

WA is not a right-to-work state

Collective bargaining agreements are not allowed to require union membership

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