Chair of Information Systems
Department of Informatics
Technical University of Munich

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Information and Knowledge Management

Module:	IN2105	**Date:**	Tuesday 6th April, 2021
Examiner:	Prof. Dr. Helmut Krcmar	**Exam:**	Retake

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Σ (Retake)	Grade (Retake)	Grade intervall
79.0	**1.7**	[76.5; 81.0)

Notes:

- Please make sure that the total amount of credits stated above is correct.
- Solely the second correction (green color) is decisive.

Corrections:
The table below lists all corrections (image recognition and complaints during review) that are already considered in the calculation of your grade. If a problem or subproblem is listed multiple times, the correction with the highest number (column “Correction”) takes precedence.

Problem	Correction	credits	Annotations

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Personal sticker S5029

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I hereby assure that I solve and submit this exam myself under my own name by only using the allowed tools listed below.
Andreas Binder

Signature or full name if no pen input available

Information and Knowledge Management

Exam:	IN2105 / Retake	**Date:**	Tuesday 6th April, 2021
Examiner:	Prof. Dr. Helmut Krcmar	**Time:**	08:00 – 09:30

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Working instructions

- This exam consists of **16 pages** with a total of **8 problems**.
  Please make sure now that you received a complete copy of the exam.
- The total amount of achievable credits in this exam is 90 credits.
- Detaching pages from the exam is prohibited.
- Allowed resources:
  - one **non-programmable pocket calculator**
  - one **analog dictionary** English ↔ native language
  - the **lecture slides, your notes, the book (Krcmar, 2015) and other recommended literature**
- **Answers are only accepted if the solution approach is documented.** Give a reason for each answer unless explicitly stated otherwise in the respective subproblem.
- **No points will be awarded for merely naming or listing terms or definitions. Always provide reasons and complete reasoning.**
- Do not write with red or green colors nor use pencils.

Left room from _____ to _____ / Early submission at _____

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Problem 1 Multiple choice problems with TUMexam (10 credits)

Mark correct answers with a cross ☒
To undo a cross, completely fill out the answer option ■
To re-mark an option, use a human-readable marking ✕■

1.0 a) Explicit knowledge is...

- ☐ Subjective
- ☐ Highly personalized
- ☐ Experiential
- ☒ Codified

1.0 b) Porter's Five Forces according to Porter (1980) do not include

- ☐ Competitors
- ☐ Customers
- ☐ Suppliers
- ☒ Governments

1.0 c) According to Gassmann et al. (2014) a business model innovation must change

- ☒ two elements of the What, Who, How and Why
- ☐ three elements of the What, Who, How and Why
- ☐ one element of the What, Who, How and Why
- ☐ four elements of the What, Who, How and Why

1.0 d) Which statement does apply for loose coupling in digital platform ecosystems:

- ☒ Elements are independent
- ☐ Elements are not scalable
- ☐ Elements are mutually dependent
- ☐ Elements are not distinct

1.0 e) What is a content objective of IT controlling according to Krcmar (2015)?

- ☐ Strategic fit
- ☐ Effectivity
- ☐ Efficiency
- ☒ Functionality

1.0 f) What is not a outsourcing location type according to Krcmar (2015)?

- ☐ Offshore
- ☒ Sideshore
- ☐ Onshore
- ☐ Nearshore

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1.0 g) What is a basic IT security objective according to Eckert (2009)?

- [ ] Access controll
- [ ] Data authenticity
- [ ] Accountability
- [x] Availability

1.0 h) What is a type of knowledge conversion according to Rehaeuser and Krcmar (1996)?

- [ ] Operationalization
- [x] Combination
- [ ] Anticipation
- [ ] Colonization

1.0 i) What is a strategic process of Knowledge Management according to Probst et al. (2010)?

- [ ] Knwledge Usage
- [ ] Knowledge Development
- [x] Kowledge Objectives
- [ ] Knowledge Identification

1.0 j) What type of innovation is not included in Henderson's and Clark's (1990) types of innovation?

- [ ] Architectural innovation
- [x] Disruptive innovation
- [ ] Incremental innovation
- [ ] Radical innovation

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Case Background

Alpine Parking, a parking garage and parking lot operator, is pursuing the strategic goal of developing new digital business models. As part of this initiative, a **prototype** of a parking app that allows users to search for and pay for paid parking spaces within the app was developed.
Your job is simple: Make this app successful and guide Alpine Parking in the digital transformation.

Problem 2 IT-Outsourcing (10 credits)

0 1 2 3 4 5 6 7 — 7.0

a) *Knowledge and understanding: 7 credits*
First, you need to finish the app development and launch the app. However Alpine Parking only has two app developers, that are also busy developing mobile apps for their ERP system. So instead of developing the app yourself, you wonder if someone else could do that for Alpine Parking.
Discuss three reasons and three risks of outsourcing from Alpine Parking's perspective (1 credit for each reason and risk). Give a recommendation to your CIO that includes a final argumentation if the reasons outweigh the risks or the other way around (1 credit).

Client Perspective - Reasons
- Concentration: IT focus on business value and strategic information systems: Alpine can focus on aspects as how to launch and how to attract customers instead ✓

- Knowledge: access specialized knowledge & novel technology; more discipline in knowledge conservation (documentation): for app development is crucial to be up tp date with the newest technology ✓

- Personnel: avoid lack of qualified IT-employees; more independent from single employees: there are only two developers, thus there is a general need to fastly hire someone ✓

Risk Client

- Personnel: loss of key employees & knowledge; motivation loss of remaining IT-employees; legal issues: those two remaining app developers might be discouraged if you continue working with the outsourcing companyy after the project is finished ✓

- Return to own IT: might not be possible (long-term commitment of contracts); rebuild know-how and whole IT department: once those employees leave you might need to rebuild your app development department ✓

- Privacy: maintain privacy of confidential data dependent on vendor: you give up control over you data ✓

I would recommed building an own department because you already have a prototype indoor and you do not have to communicate what was aready done ✓

0 1 2 3 — 3.0

b) *Knowledge and understanding: 3 credits*
The CIO decides to outsource the app development and hosting to an IT company in Eastern Europe. One of the app developers approaches you, that he is now scared to lose his job. You want to assure him, that his job is safe. Name three core competencies to retain in the company and explain for each competency why it must retain in the company (1 credit for each explanation).

core competencies to retain in own company:
- development of strategy & architecture: only the operations part should be outsourced, otherwise the outsourcing company is basically driving your company ✓
- establishment of standards: if there are many differend standards you would have to adhere to then this would increase the cost of just using multiple vendors ✓
- capability to evaluate outsourcing options: once you do not evaluate the projects properly then you cannot choose the most suitable outsourcing comany ✓

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Problem 3 Platform Ecosystems (10 credits)

The parking app is to be embedded in the Digital Platform Ecosystem of the PAS (Parking Automation Solution) platform. PAS Co. is the owner of the PAS platform. Alpine Parking acts as a complementor in the platform ecosystem.

4.0

a) *Application and analysis: 4 credits*

Explain the two value creating mechanisms in platform ecosystems according to Hein et al. (2020)* (1 credit each). Provide one example for each mechanism - either using the PAS platform or the Alpine Parking App or any real-world example - and explain how this example leverages the value-creating mechanism (1 credit each).

* Hein, A., Schreieck, M., Riasanow, T., Setzke, D. S., Wiesche, M., Böhm, M., and Krcmar, H. (2020). Digital platform ecosystems. Electronic Markets, 30(1), 87–98.

0 1 2 3 4

- efficient & convenient facilitation of transactions
 - help complementors and consumers locate, interact and exchange value
 - acts as an intermediary by directly matching supply to demand
-> more easy to locate parking space and also to pay via the app

- provision of affordances making the digital platform a breeding ground for innovation
 - platform owners offer development tools for complementors
 - use boundary-resources to co-create value-adding complements
-> with the boundary support of the platform the developers could work on making the matching algorithm more efficient which qualifies as incremental innovation

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4.0

b) *Knowledge and understanding: 4 credits*

There are four enablers of these two value creating mechansism in platform ecosystems according to Hein et al. (2020)*. Explain what these enablers are and how they each enable a value creating mechanism (1 credit for each enabler). * Hein, A., Schreieck, M., Riasanow, T., Setzke, D. S., Wiesche, M., Böhm, M., and Krcmar, H. (2020). Digital platform ecosystems. Electronic Markets, 30(1), 87–98.

0 1 2 3 4

- Supermodularity:
 - increased amount of product A makes product B more valuable
 - A and B are different products (e.g. sell apps → value phone increases)
 - about network effects
-> offering one product not only makes itself more valuable but also all complementary products: app for parking combined with app for restaurants

- Generativity:
 - capacity to produce unprompted changes driven by varied audiences
 - ecosystem builds itself analoguous to real ecosystem
-> once the user have the parking app they might also demand related products, as for example apps that locate nearby shopping possibilities

- Economies of scale and substitution:
 - Reusing modular components
 - thus, easier to implement new transactions and innovations
-> if as platform owner you provide an easy way to deploy and launch apps, this way can be used by multiple vendors

- Affordances:
 - digital infrastructure build upon a modular software-based platform
 - reconfigure platform to adapt user needs and prompt new technological advances
 - allow developers/ users to do sth
-> acts as boundary resource eg workshop to inform developers about newest technological trends

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0 1 2 2.0

c) *Application and analysis: 2 credits*

Considering the PAS platform a two-sided market: On the one side there are apps related to parking and car traffic. On the other side there are car owners and drivers using the platform and its apps. Explain what are indirect network effects (1 credit). Why are they important for Alpine Parking as an app developer (1 credit)?

indirect network effects exist if an increased usage on our side increases the value on the other side

if more people use the platform the more people with use the app. Specifically the developers might also get feedback like the in appstore to make the app even better

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Problem 4 IT-enabled strategies (10 credits)

2.0 a) *Knowledge and understanding: 2 credits*
In your own words, describe, what makes an information system (IS) a strategic IS (SIS). Do not copy paste the definition from the slides.

0 1 2

a SIS ensures that you IS gives you an competitive advantage. It is unique to your company and is not the standard IS one might get ✓

2.0 b) *Application and analysis: 2 credits*
Krcmar (2015) defines four categories of SIS. Explain in which category the Alpine Parking app and the PAS digital platform fit (1 credit each).

0 1 2

App: value added service: app more comfortable that manual search ✓
platform: Electronic market: enable and merge transactions alias the finding the right spot ✓

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2.0 c) *Application and analysis: 2 credits*
Steininger (2019) defines four types of IT-associated business models along three axis. Explain in which type the Alpine Parking app fits. Use all three axes in your explanation. (0,5 credit for correct type, 0,5 credit for each axis used in the explanation)

0 1 2

infrastructure mgt: use of IT
customer interface: use of IT
product value/ ceration: use of IT

-> Ubiquity ✓

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0 1 2 3 4 — 2.0

d) *Application and analysis: 4 credits*

Henderson and Clark (1990) define four types of innovation. Explain which type of innovation fits the Alpine Parking app (1 credit). Explain the three other types and why the app does not fit these types (1 credit per type).

Assume that the Alpine Parking app is the first app that allows car owners to search and pay for parking spaces using their smartphones. Without the app car owners have to search parking spaces manually and use vending machines or parking meters to pay for parking spaces.

Types of Innovation
- Core Concepts, Linkage between Core Concepts and Components
- Reinforced
 - unchanged: incremental innovation
  - refines and extends an established design
  - improvement in individual components
  - underlying core design concepts, and links between them, remain the same
-> linkage is changed via app thus not unchanged

 - changed: architectural innovation
  - reconfiguration of an established system
  - changes only the relationships between existing core design concepts
  - link existing components in a new way
-> fits here: concept of parking the same, but the interaction via app is new → new component

- Overturned
 - unchanged: Modular Innovation
  - changes only the core design concepts
  - without changing the product's architecture
-> core design concepts are the same

 - changed: Radical Innovation
  - establishes a new dominant design
 - new core components that are linked in a new architecture
-> core design concepts are the same

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Problem 5 Platform Governance (10 credits)

3.0 a) *Knowledge and understanding: 4 credits*

PAS provides several boundary resources for its platform. Explain what are boundary resources in digital platform ecosystems (1 credit). Explain three types of boundary resources presented in the lecture and name one example for each type (1 credit per type).

0 1 2 3 4

Boundary Resources (BR)
- Def.: resources that support developers in their effort; BR define interaction with platform; BR implement platform governance
- Application: Technical resources (e.g. support with Hardware)
- Development: Support dev. process (e.g. SDKs)
- Social: Control interactions and behavior (e.g. automatic feedback app store)

-1 copy + paste

4.5 b) *Application and analysis: 6 credits*

PAS also implements platform governance mechanisms for its platform ecosystem. Name and explain three dimensions of platform governance according to Tiwana (2014) (1 credit per dimension). In particular, explain two aspects per dimension, describing how this dimension can be implemented. (0,5 credit per aspect)

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0 1 2 3 4 5 6

Platform Governance App Store: 3 dimensions
- Decision rights partitioning: provide autonomy
- platform owner can transfer decision rights
- Platform decision rights: whether owner & app developers make decisions pertaining to platform
- App decision rights
- 2 classes decision rights: Strategic & Implementation

- Control portfolio design: ensure integration (control development process of third- parties)
- gatekeeping: who and what apps are allowed
- process control: incentives to follow prescribed development methods
- metrics: incentives based on predefined performance metrics
- relational control (informal): norms & values of a platform

- Pricing Policy: Create Incentives to invest in own app
- 4 questions: symmetric or asymmetric, pricing for access or usage, pie-splitting using fixed or sliding scale, app pricing
- Asymmetric: subsidize one side, make up losses by increased profit from another
- revenue sharing & subsidizing

-1,5 copy + paste

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Problem 6 Knowledge Management (16 credits)

As part of their partner programm PAS invites platform complementors to workshops, presentations and trainings. For Alpine Parking, you always participate in these events. Since you only stay in five-star hotels, your CFO wants to know if your participation in these events is always necessary. You argue, that this helps the knowledge management of Alpine Parking.

6.0

a) *Knowledge and understanding: 8 credits*

Explain the 8 core processes of knowledge management according to Probst et al. (2010). Explain the task of each process (1 credit per process).

Knowledge Objectives
- what kind of knowledge important today as well as in the future with a knowledge-based competitive advantage
- where in the organization is what kind of knowledge needed
- strategic planning of organizational knowledge base

Knowledge Identification
- how to create transparency about existing knowledge
- task: analysis and description of knowledge environment

Knowledge Acquisition
- what capabilities to acquire from external sources
- task: what knowledge to acquire through recruiting or acquisition (consultants)

Kopie von Folien - 2 Punkte Abzug

Knowledge Development
- build up new knowledge
- task: build new knowledge additional to external acquisition

Knowledge Sharing and Distribution
- get knowledge to the right places
- task: make knowledge accessible for people who need it

Knowledge usage
- make sure knowledge is actually used
- task: ensure productive use of organizational knowledge

Knowledge Conservation
- guard myself against knowledge losses
- task: select important knowledge, ensure adequate storage, regular updates

Knowledge Assessment
- do KM investments pay off
- measure effort in KM: select suitable indicators
- reveal success and failure in KM
- without measure KM would NOT be efficient → cycle incomplete

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7.0 b) *Application and analysis: 8 credits*

For each process explain one specific exemplary problem that can ocurr if Alpine Parking does not implement this process (1 credit per problem; max. 1 credit per process).

0 1 2 3 4 5 6 7 8

Knowledge Objectives
- if the objectives are not in line with the strategy, there will not be a competitive knowledge based advantage
- if the operative part is not defined for example, the day to day process will not be as efficient

Knowledge Identification
- if alpine does not identify that the have already made a prototype (awareness about prototype), they might redo the work, wasting resources

Knowledge Acquisition
- it poses a problem if alpine decides to get knowledge from two consulting companies which might have the same information thus not acquisitiion wasted resources

Knowledge Development
- if alpine does not have its on R&D team that can tell which technological trends are really important, then they rely to much on other providers and cannot judge on their own

Knowledge Sharing and Distribution
- for example if I develop one part of the app but do not tell my coworkers another coworker might do the same, thus wasting time

Knowledge usage
- if they already developed an app and it was not a success they could find out the lessons learned to be better prepared for the parking app

Knowledge Conservation
- bad or missing documentation might also lead to the same mistakes in the development process

Knowledge Assessment
- if they do not do this step, all before mentioned steps might worsen, losing knowledge and missing opportunituies

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Problem 7 IT-Controlling (12 credits)

The CFO is still not convinced. He wants to take a closer look at the financial numbers of the Alpine Parking app.

0 1 2 3 4 5 6 6.0

a) *Knowledge and understanding: 6 credits*

The next day you have lunch with a friend who works in the controlling team. He says the app project is doing fine because it is part of Alpine Parking's digital business strategy. In your next project meeting you explain your team, what your friend told you. Explain the goal of each of the three IT-Controlling functions according to Krcmar (2015) (1 credit per function). Explain what each function does using the example of the Alpine Parking app (1 credit per function).

IT Controlling functions / IT process model:
- Project portfolio controlling: Make selection of fitting IS project transparent
 - it strategy development
 - development of IT strategy and master plan
 - definition of hardware, software and security standards
 - planning of IT portfolios and priorities
-> basically it is the step where alpine decided that the app is worth developing and that is aligned with the business strategy

- Project controlling: execute projects correctly (plan, manage, monitor costs, schedules, services)
 - it development
 - development and maintenance of individual software
 - implementation of standard application software
-> this is the step where they decide on whether to outsource or not and how schedule looks like etc

- Product and infrastructure controlling: Monitoring of product use through product life cycle (handle operation)
 - it operations
 - compilation and operation of IT infrastructure (networks, central server)
 - service and user support
 - supply of desktop services
-> this is looking whether the app is running and if their are bug request etc coming in

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6.0 b) *Knowledge and understanding: 6 credits*

You are worried that something unexpected infers your good controlling assessment. So you sit down with your team and think how you can avoid a threat to the project success. Explain the four steps of the risk management process according to Krcmar (2015). For each step explain the task (1 credit per step) and give an example of a tool or method that can be used in this step (0,5 credit per example).

0 1 2 3 4 5 6

Risk Identification
- transfers uncertainties in a set of clearly defined risks
- tools: expert interviews: ask people who alredys deployed innovative and cool apps and ask for pitfalls

Risk Analysis
- assesses identified risks regarding their …
- … probability of occurrence
- … (negative) impact on the project/organization
- tools: threat tree: check which kind of attacks are most likely to occur

Risk Handling
- evaluates, plans, and executes strategies for the analyzed risk
- tools: risk strategy list, decision tables/trees, cause-and-effect analysis

exp: risk strategy list: follow some best practices as a rough guide as the Nelson defined them

Nelson Best Practices

avoid …
- … poor estimating, scheduling & planning
- … ineffective stakeholder management
- … insufficient risk management
- … insufficient planing
- … shortchanging quality assurance
- … weak personnel and/or team issues
- … insufficient project sponsorship

Risk Monitoring
- tracks risk evolution over time
- tools: risk visualizations: check how the risk develop, whether it increases or decreases and whether further actions are necessary

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Problem 8 Strategy (12 credits)

Heureka! You made it - The app is ready! The app is launched in PSA's app store and featured as the recommended app for easy parking. To make the app a long-term success you think about strategy theories you learned about in uni.

0 1 2 3 4 5 — 4.0

a) *Application and analysis: 5 credits*
Compare and discuss the market-based view (Porter's Five Forces) and the resource-based view. Name and briefly explain one benefit and one drawback for each of the two theories (1 credit for each benefit or drawback). Which aspect clearly differentiates the two views? (1 credit)

MBV
+ allows companies to search for attractive markets and position yourself within
- very extensive and expensive

RBV
+ leverages special internal competencies and resources for long term success
- neglects external factors

Main difference is that MBV focussess exclusively on the external side, while RBV on the internal side

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0 1 2 3 4 5 — 2.5

b) *Application and analysis: 5 credits*
You are pretty confident about Alpine Parking's resources and capabilities and how they are leveraged. You wonder how other companies react to the success of the Alpine Parking app. So you apply the model Porter's Five Forces to the Alpine Parking case. Take the Alpine Parking as the focal company and the Alpine Parking app as the core product of the company. Name and explain the five forces in this case and how they impact Alpine Parking.
Hint: You can make assumptions, e.g., for made up examples. State these assumptions in your answer.

Market-Based View (MBV) - Porter's Five Forces
- new market entries (barriers to entry): cost of developing apps, adherence of standards (how expensive is it)
- supplier (bargaining power): outsourcing company
- customer (bargaining power): app users
- substitute products/ services: another company offering a similar app
- competition within market: companies offering substitute

2pt for naming
0,5pt for explanations as they are mostly unclear and underdeveloped

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2.0 c) *Knowledge and understanding: 2 credits*

0 1 2

One month after the launch of the app, your CEO calls and wants to know how much money Alpine Parking has earned from the app. You look at the numbers and see that the company is still losing money with the app. Explain two reasons, why the IT investment in the app does not provide obvious value in form of profit. (1 credit per reason)

- IT/IS based value could be latent (time lag): it might be considered a long term investment since you first need to build a user base
- IT/IS value manifests in many ways : building a customer base and expertise in app development is already an intangible asset

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Additional space for solutions–clearly mark the (sub)problem your answers are related to and strike out invalid solutions.

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