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Fostering adoption, acceptance, and assimilation in knowledge management system design

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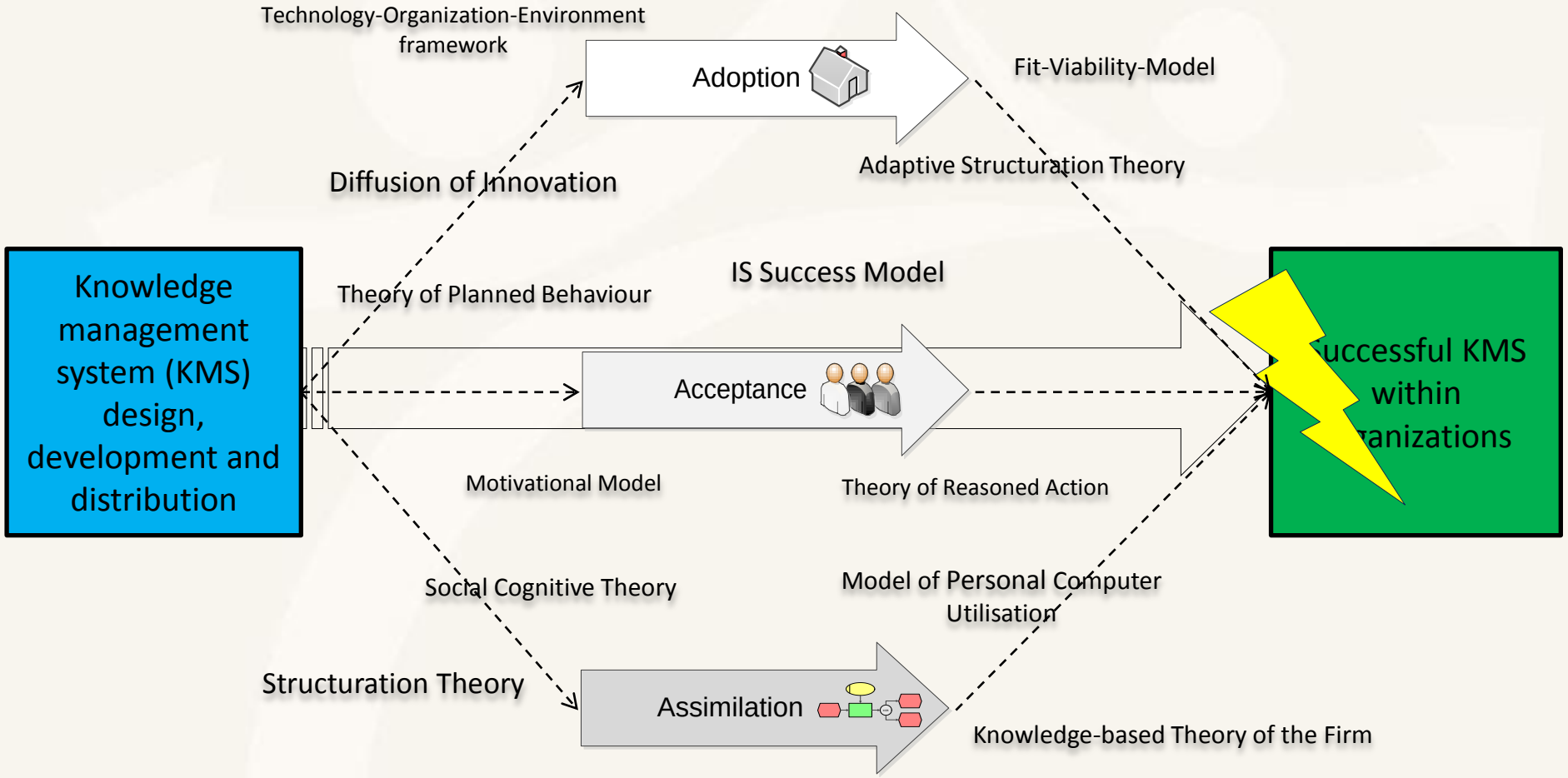
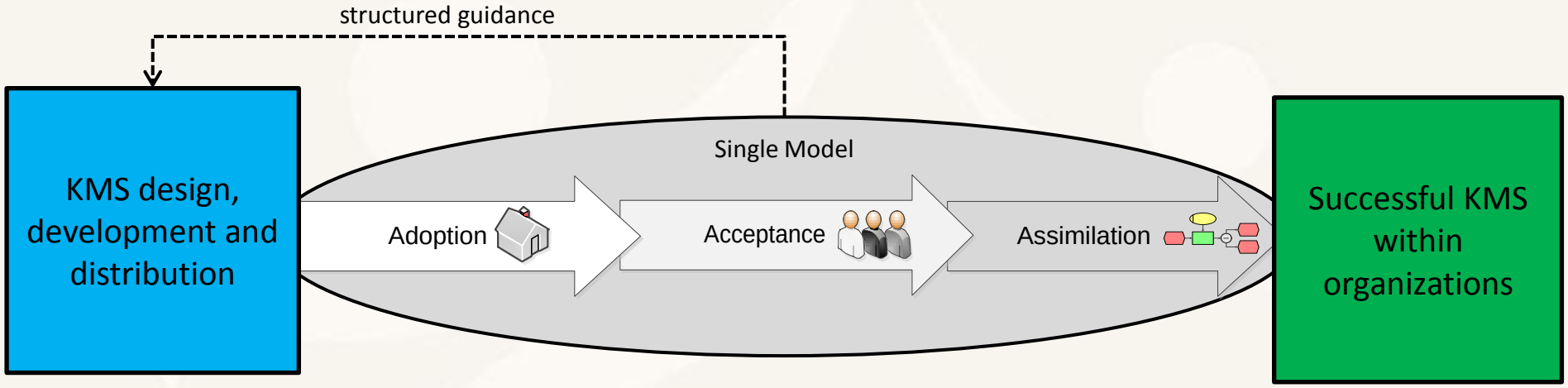
Agenda

- Motivation & Vision
- Model Development
- Resulting Model
- Model Application
- Conclusion, Limitations & Outlook

Motivation


Technology-Organization-Environment framework
Adoption
Fit-Viability-Model
Diffusion of Innovation
Adaptive Structuration Theory
Knowledge management system (KMS) design, development and distribution
Theory of Planned Behaviour
IS Success Model
Acceptance
uccessful KMS within anizations
Motivational Model
Theory of Reasoned Action
Social Cognitive Theory
Model of Personal Computer Utilisation
Structuration Theory
Assimilation
Knowledge-based Theory of the Firm

Vision



- A single comprehensive model aiming to cover factors for the whole process from adoption to assimilation
- The model shall provide structured guidance in evaluating and informing design activities in order to improve adoption, acceptance and assimilation

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Model Development

Model Development Approach

Model Development Approach

I: Analyse models & theories:

- Literature review to identify models and theories from social science, behavioural science and information systems (IS)
- Analysis of applications in an IT context to explain adoption, acceptance and assimilation
- Association of models and theories to one of the three topics

Adoption

= an organization's decision to make use of an information technology (IT) solution / KMS (Rogers 1995)

Identified models and theories:

- *Technology-Organization-Environment framework (Tornatzky & Fleischer 1990)*
- *Diffusion of Innovations Theory (Rogers 1995)*
- *IS Success Model (DeLone & McLean 2003)*
- *Fit-Viability-Model (Liang et al. 2007)*

Acceptance

= the decision of a user to use an IT solution / KMS (Dillon & Morris 1996)

Identified models and theories:

- *Theory of Reasoned Action (Fishbein & Ajzen 1975)*
- *Theory of Planned Behavior (Ajzen 1991)*
- *Technology Acceptance Model (Davis 1989)*
- *Motivational Model (Davis et al. 1992)*
- *Model of Personal Computer Utilization (Thompson et al. 1991)*
- *Social Cognitive Theory (Bandura 1985)*
- *Diffusion of Innovations Theory (Tornatzky & Klein 1982)*
- *Unified Theory of Acceptance and Use of Technology (Venkatesh et al. 2003)*

Assimilation

= the diffusion of an IT solution / KMS into organizational work processes and corresponding daily activities (Chatterjee et al. 2008)

Identified models and theories:

- *Institution Theory (Chatterjee et al. 2008)*
- *Structuration Theory (Giddens 1984)*
- *Adaptive Structuration Theory (Poole & DeSanctis 2004)*
- *Diffusion of Innovations Theory (Attewell 1992)*
- *Knowledge-based Theory of the Firm (Grant 1996)*
- *Business Process Management Theory (Becker et al. 2003)*

Model Development Approach

II: Collect factors

- Sequentially extract factors from models and theories for each topic
- Eliminate duplicates and merge similar factors
  (e.g. *Perceived usefulness* and *usefulness*)

Results

- Adoption:
  - 4 theories/models
  - → 37 factors
- Acceptance:
  - 7 theories/models
  - → 22 factors
- Assimilation:
  - 6 theories/models
  - → 22 factors

Table 1: List of Factors for Organizational Adoption

Factor name	Model/Theory
Adopter type	
Availability	
Characteristics	
Commercial Advantage	
Communication Process	
Community Norms	
Compatibility	
Complexity	
Cultural Values	
Formal and Informal Linking Struct	
Funding	
Government Regulations	
Industry Characteristics and Market	
Informal Communication	
Information Quality	
Management Hierarchy	
Observability	
Opinion Leaders and Change Agent	
Organizational Impact	
Organizational Viability	
Price	
Problem Solver	
Relative Advantage	
Risk	
Size	
Service Quality	
Slack Resources	TOE
Standard	DOI
System Quality	ISSM
Task-Technology Fit	FVM
Technological Edge	DOI
Technological Experience	DOI
Technological Infrastructure	DOI
Technology Support Infrastructure	TOE
Trialability	DOI
User Need Recognition	DOI
User Resistance	DOI

Table 3: List of Factors for Process Assimilation

Factor name	Model/Theory
Communication Channels Use	DOI
Decision-making Patterns	DOI
Extent of Coordination	INST
Functional Integration	DOI
Knowledge Barrier	DOI
Knowledge Embeddedness	DOI
Management Championship	INST
Methodology Influence	INST
Organizational Size	KBT
IT Function Size	DOI; INST
Process Cost	BPM
Process Quality	
Process Time	
Process Satisfac	
Promotion of C	
Quality of Senic	
Sophistication o	
Strategic Invest	
Structures of Sig	
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Top Managemer	

Table 2: List of Factors for User Acceptance

Factor name	Model/Theory
Affect Towards Use	SCT; MPCU
Anxiety	SCT
Attitude Toward Behavior	TRA; TPB
Compatibility	DOI
Complexity	MPCU
Ease of Use	DOI; TAM; TAM2
Extrinsic Motivation	MM
Facilitating Conditions	MPCU
Image	DOI
Intrinsic Motivation	MM
Job-Fit	MPCU
Long-term Consequences	MPCU
Outcome Expectations - Performance	SCT
Outcome Expectations - Personal	SCT
Perceived Behavioral Control	TPB
Usefulness	TAM; TAM2
Relative Advantage	DOI
Results Demonstrability	DOI
Self-efficacy	SCT
Social Factors	MPCU
Subjective Norm	TRA; TAM2; TPB
Visibility	DOI

Model Development Approach

III: Categorize factors

- Combine similar/related factors to categories to offer guidance on different level of granularity (single factor & category level)
- Example: *Environment*, *Performance Expectancy*, *Process Characteristics, Social Influences…*

Model Development Approach

IV: Analyse influenceability

- Analyse groups and determine if the factors can be directly influenced within the design of KMS
  - →Groups with factors that can be influenced by design activities (e.g. *System Quality, Results Demonstrability, Compatibility*…)
  - →Groups with factors that cannot be influenced by design activities (e.g. *Government Regulations, Intrinsic Motivation, IT Function Size*…)

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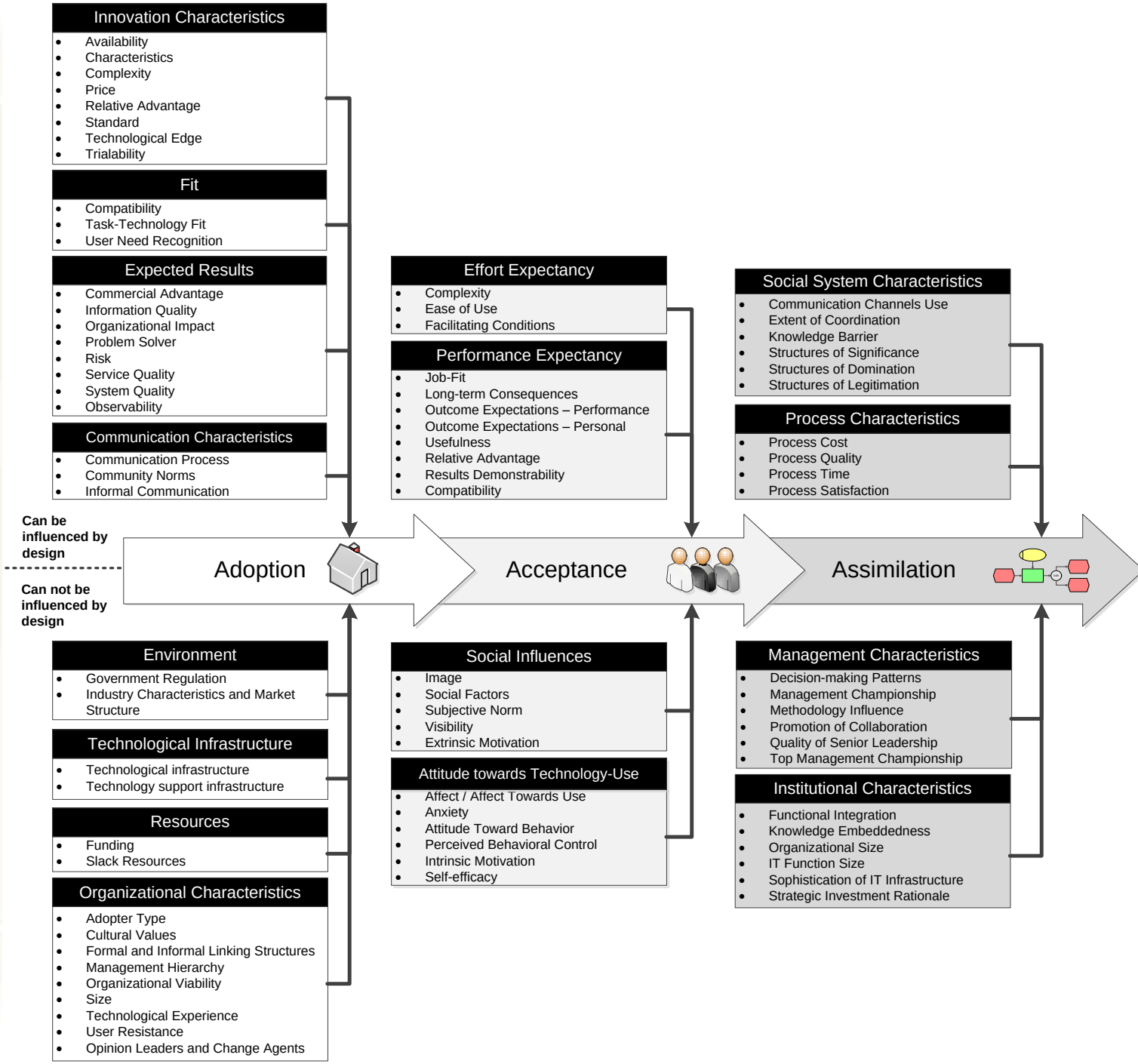
Resulting Model

Resulting Model



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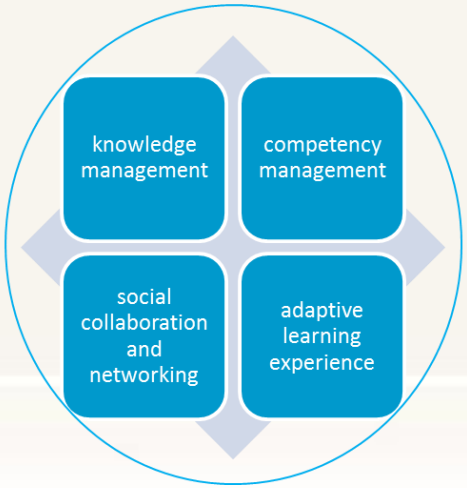
Model Application

The ARISTOTELE Project

- FP7 founded project; 8 consortium partners in Germany, Italy, Slovenia and Austria
- ARISTOTELE will enhance learning and training of the employees within their organisations, defining and developing models, methodologies, technologies, and tools to support the emergence of competences and creativity, by self-organizing acquisition, processing, and sharing of new information and knowledge with peers.
- To achieve this ARISTOTELE will design and develop a prototype platform presenting possibilities to support
  - creation and execution of personalised learning activities supporting a hybrid (adaptive and non-adaptive) strategy
  - innovation building and management processes
  - collaborative knowledge exploitation and acquisition during the daily employees activities
- Duration: July 2010 – June 2013 (3 years)



Model application in ARISTOTELE

Development of 77 recommendations for KMS design by evaluating requirements, technological trends, and the ICT landscapes of pilot organizations:

- Adoption class: Fit → Task-Technology Fit, User-Need Recognition

Recommendation to draw upon existing system functionalities, which can be composed and further customized to adapt to user's context and needs.

- Acceptance class: Effort Expectancy → Complexity, Ease of Use

Recommendation for additional functionalities to provide a number of exemplary configuration for different user needs in order to improve acceptance among users.

- Assimilation class: Process Characteristics: →Process Satisfaction

Recommendation for monitoring functionalities to increase process transparency and hence improve process satisfaction.

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Limitations ,Conclusion & Outlook

Limitations

- Empirical validation: problematic due to the large number of interdependent variables in a dynamic socio-technical environment
- Categories of factors: first categorization on argumentative basis, may not be suitable for all applications
- Influenceability: distinguished on the basis of the application in the ARISTOTELE project, generalisability cannot be ensured yet

Conclusion

KMS design and deployment in organisations is still a major challenge!

- Our model shows a way how to use the fundus of theories and models in practical KMS design and deployment
- Single, comprehensive model for systematic consideration of factors adoption, acceptance and assimilation
- Contribution towards bridging behavioural and design science research
- Manifold applicability in KMS design
  - Evaluating (non-)functional requirements
  - Eliciting additional requirements
  - Improving packaging and offering

Outlook

- Incorporate additional factors proposed by KMS literature (e.g. Hung et al. 2005 or Wong 2005)
- Application of the model from an organizational perspective concerning the factors that are not influenceable in KMS design (e.g. planning roll-out, training, responsibilities)
- Review and update the categories in the model with insights from further applications

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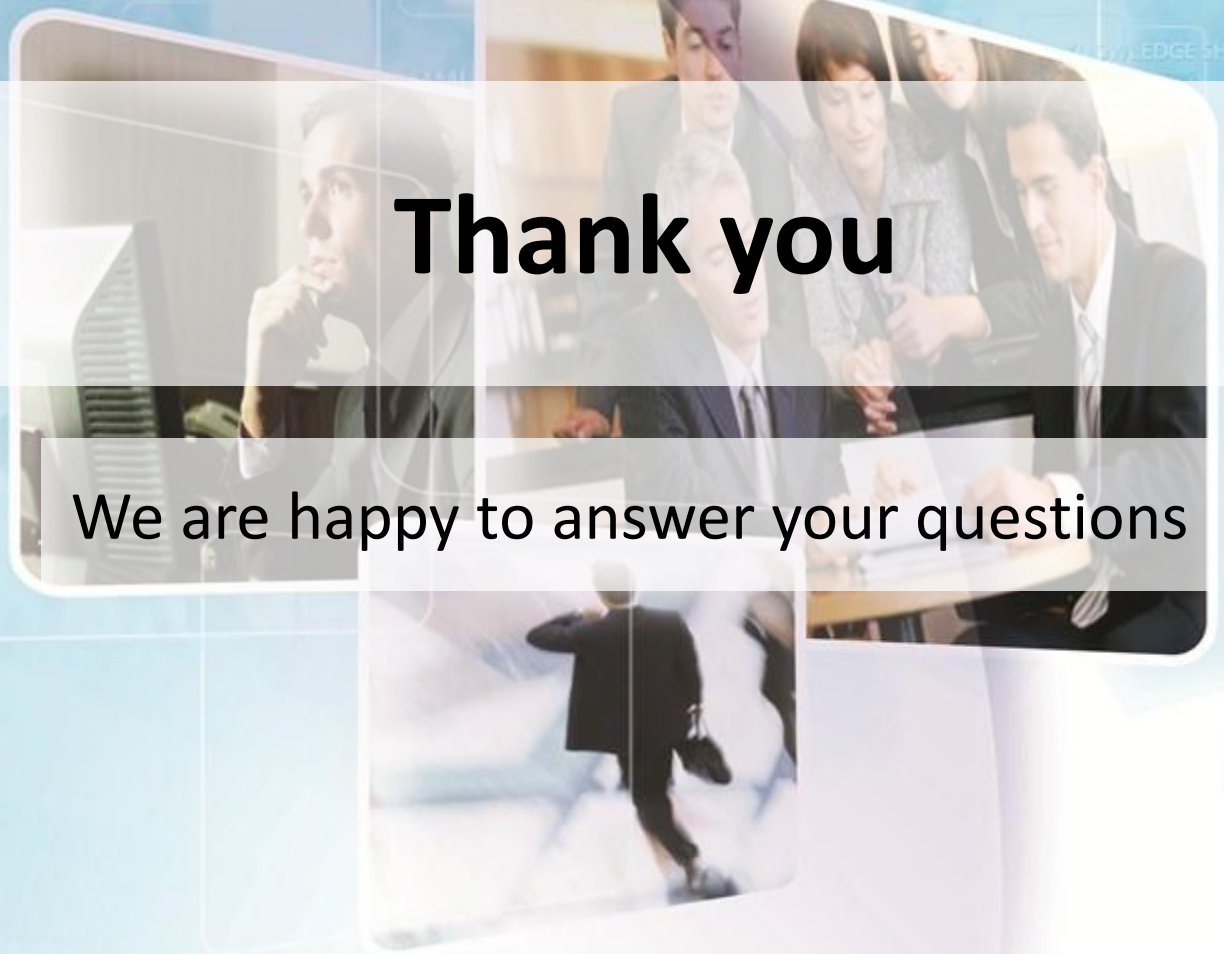

Thank you

We are happy to answer your questions

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