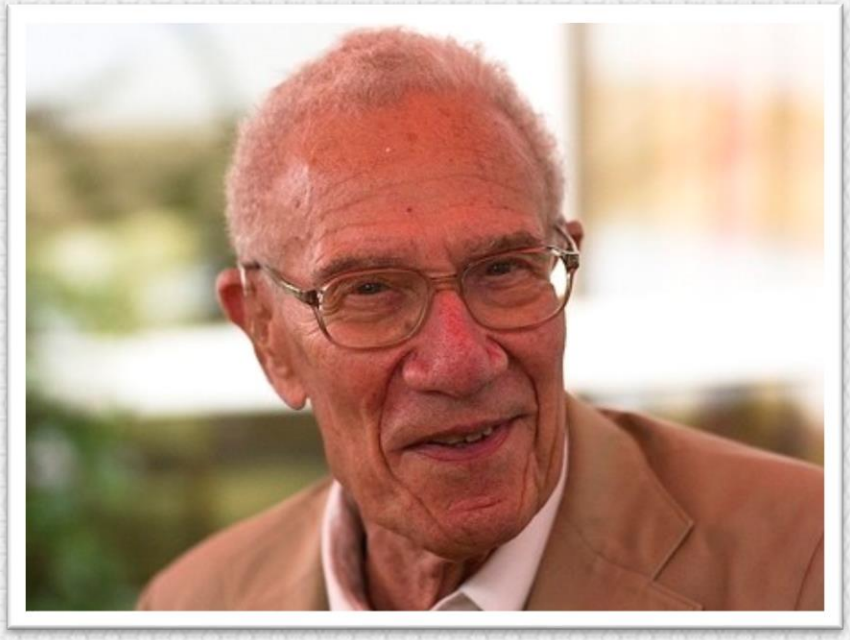
FINTECH
HANGSUN
ASSOCIATE
PROFESSOR

INNOVATION

INNOVATION



"You can see the computer age everywhere but in the productivity statistics." (Robert Solow, 1987)

Digital Transformation

- Some believe that a digital transformation is simply a matter of using digital technologies to sell and service clients more effectively, more efficiently, and in a more customized way.
- There are also other interpretations of what digital transformation is:
  - A new application of digital initiatives, such as marketing;
  - A matter of using technology to drive business process innovation;
  - Nothing less than to be the Uber of taxi or the Airbnb of hoteling, and more.

Digital Transformation

- Why digital transforms the organization?
- For whom to do the transformation?
- What is the product it should aim to provide?
- Where can it take place?
- When can it take place?
- How to implement a digital transformation?

Product Innovation: Mobility

- Mobility is at in the center of several financial institutions' business plans.
- Mobile financial services refer to the provision and availability of banking- and financial services with the help of mobile telecommunication devices (a mobile device or a software designed for being executed on mobile devices).

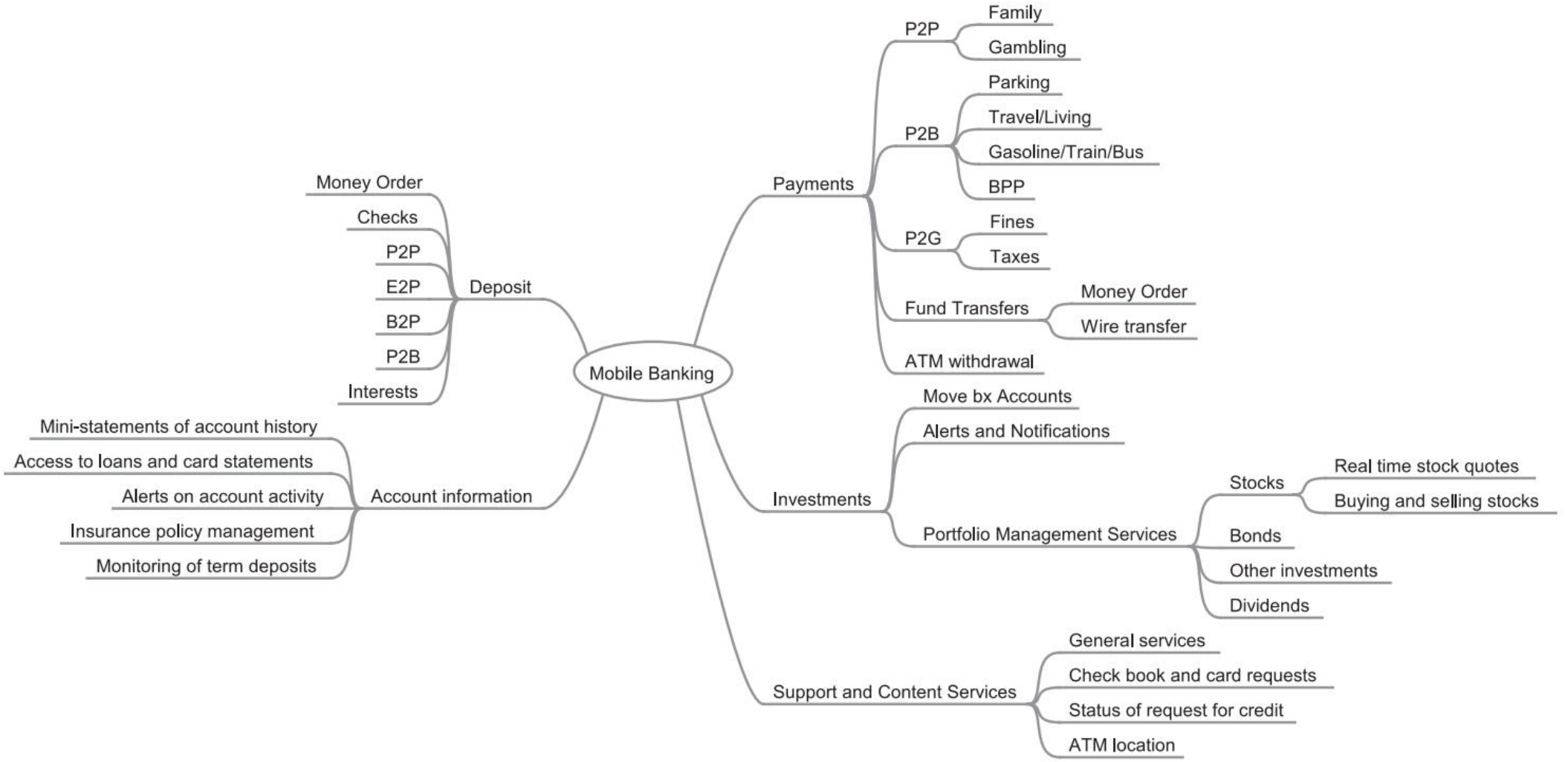


Fig. 4.2 Services in mobile banking

Table 4.3 Most used Fintech services (Ernst & Young 2016)

Transaction	Event	Percentage (%)
Money transfers/ Payments	• Use of non-banks to transfer money • Online foreign exchange • Overseas remittances	17.6
Savings/Investment	• Online stockbroking/spread bettings • Online budgeting/planning • Online investments • Equity and rewards crowdfunding • P2P	16.7
Insurance	• Car insurance using telematics • Healthcare premium aggregators	7.7
Borrowing	• Borrowing via P2P websites	5.6

Product Innovation: Mobility

The organization's focus should be on five elements:

- The centricity of customers in all aspects of the value proposition;
- The enlargement of the business, from informational to transactional;
- The creation of synergies between the product and other solutions, as Big Data Analytics and virtual robotics;
- The importance of being agile and forward-looking;
- The building of a simple but secure solution.

Process Innovation: Big Data Analytics

- Big Data Analytics is the use of a large collection of data gathered and collected from inside and outside the company.
- Big data are so big that traditional processing applications are enough.
- Big Data Analytics means:
  - storing a large amount of data;
  - examining (or mining) them;
  - getting appropriate information;
  - identifying hidden patterns, unknown correlations, and similar things in support of decision-making.

Process Innovation: Big Data Analytics

- Big Data Analytics has three characteristics - the so-called 3 Vs:
  - Volume: The quantity of data should be relatively large.
  - Velocity: Financial institutions must be able to process, access, analyze, and report huge volumes of information as quickly as possible in order to make timely decisions, especially in the operational environment.
  - Variety: The majority of organization's data (estimated on average around 85%) is unstructured.
    Unstructured data (or unstructured information) is information that either does not have a pre-defined data model or is not organized in a pre-defined manner. Unstructured information is typically text-heavy, but may contain data such as dates, numbers, and facts as well. This results in irregularities and ambiguities that make it difficult to understand using traditional programs as compared to data stored in fielded form in databases or annotated (semantically tagged) in documents.
- There are three other Vs that are important to consider:
  - There should be a concern about the "veracity" of data.
  - "Vulnerability" is also important.
  - Last but most important, "value" refers to the ability to turn the data into value.

Process Innovation: Big Data Analytics

- Analytics 3.0:
  - Analytics 1.0 is the business intelligence before the Big Data Analytics. It was mainly devoted to analyzing small internal problems since the amount of data available was small.
  - Analytics 2.0 was a step forward thanks to the rise of Big Data Analytics. It can be used also for predictive analytics besides historical analysis.
  - A new wave is Analytics 3.0. It is a new resolve to apply powerful data gathering and analysis methods to a company's operations and to its offerings - to embed data smartness into the products and services customers buy.

Era	1.0 Traditional analytics	2.0 Big data	3. 0 Data economy
Timeframe	Mid-1970s to 2000	Early 2001 to 2020	2021 and in the future
Culture	Competition not on analytics	New focus on data-based products and services	Agile method where all decisions are driven (or at least influenced) by data
Type of analytics	95% reporting, descriptive; 5% predictive, prescriptive	85% reporting, descriptive; 15% predictive, prescriptive (visual)	90%+ predictive, prescriptive, automated reporting
Cycle time	Months	An insight a week	Millions of insights per second
Data	Internal, structured	Very large, unstructured, multisource	Seamless combination of internal and external data; analytics embedded in operational and decision processes
Technology	Rudimentary business intelligence (BI), reporting tools; dashboards; data stored in enterprise data warehouses or marts	New technologies: Hadoop, commodity servers, in-memory, open source	New data architectures, beyond the data warehouse; new application architectures
Organization	Analytical people segregated from business and ICT	Some chief data officers appear in some advanced companies; data scientists are on the rise	Centralized teams, specialized functions among team members; dedicated funding

Process Innovation: Big Data Analytics

- Why should financial services use Analytics 3.0?
  - Low costs since it can use the lower costs of processing a large amount of data made possible with the Big Data Analytics solutions;
  - Personalized to each customer, thanks to a powerful Big Data Analytics.
- It requires:
  - recording the behavior of the customers: through his/her accesses,
  - transactions, and, if available, social networks, with their consent;
  - processing of all these data versus a “model” which might provide useful information for marketing, investment, or risk-averse actions;
  - suggesting or taking actions with the customers, which would add value to him/her;
  - reporting and getting the feedback of the customer to improve the services.

Process Innovation: Internet of Things

Internet of Things (IoT): IoT is the interconnection of uniquely identifiable embedded computing devices within the existing internet infrastructure. IoT allows using the internet to connect not only persons but also objects of any type.

"We work every day to make payments faster and easier for merchants and consumers across the world. As the number of connected vehicles on the road increases, so does our ability to bring this secure frictionless option of online commerce to consumers everywhere." - Jim McCarthy, Executive Vice President, Innovation & Strategic Partnerships, Visa Inc.

Visa, collaborating with Pizza Hut and Accenture, is working on a POC connected car to test mobile and online purchases on the go. The connected car could use Visa Checkout, Visa's online payment service, cellular connectivity, Bluetooth low energy (BLE), as well as beacon technology deployed at Pizza Hut restaurants to alert the staff when the customer has arrived and is ready to pick up the order.

Process Innovation: Blockchain

- Blockchain is a distributed database, able to generate a public ledger of all the transactions, not entirely stored at a single physical location, but rather dispersed over a network of interconnected computers.
- Public vs. private:
  - Public: Any user who wishes to do so can access the ledger and submit transactions for inclusion.
  - Private: Only a select few participants can view as well as submit transactions.
- Permissionless vs. Permissioned:
  - Permissionless means that anyone can contribute to the blockchain. Once verified, the transaction is added to the blockchain.
  - With a permissioned blockchain, a financial institution must verify non-cash payments between individuals for the transaction to be complete.
- Blockchain and smart contract.

  A smart contract is a computer protocol intended to digitally facilitate, verify, or enforce the negotiation or performance of a contract. Smart contracts allow the performance of credible transactions without third parties. These transactions are trackable and irreversible.

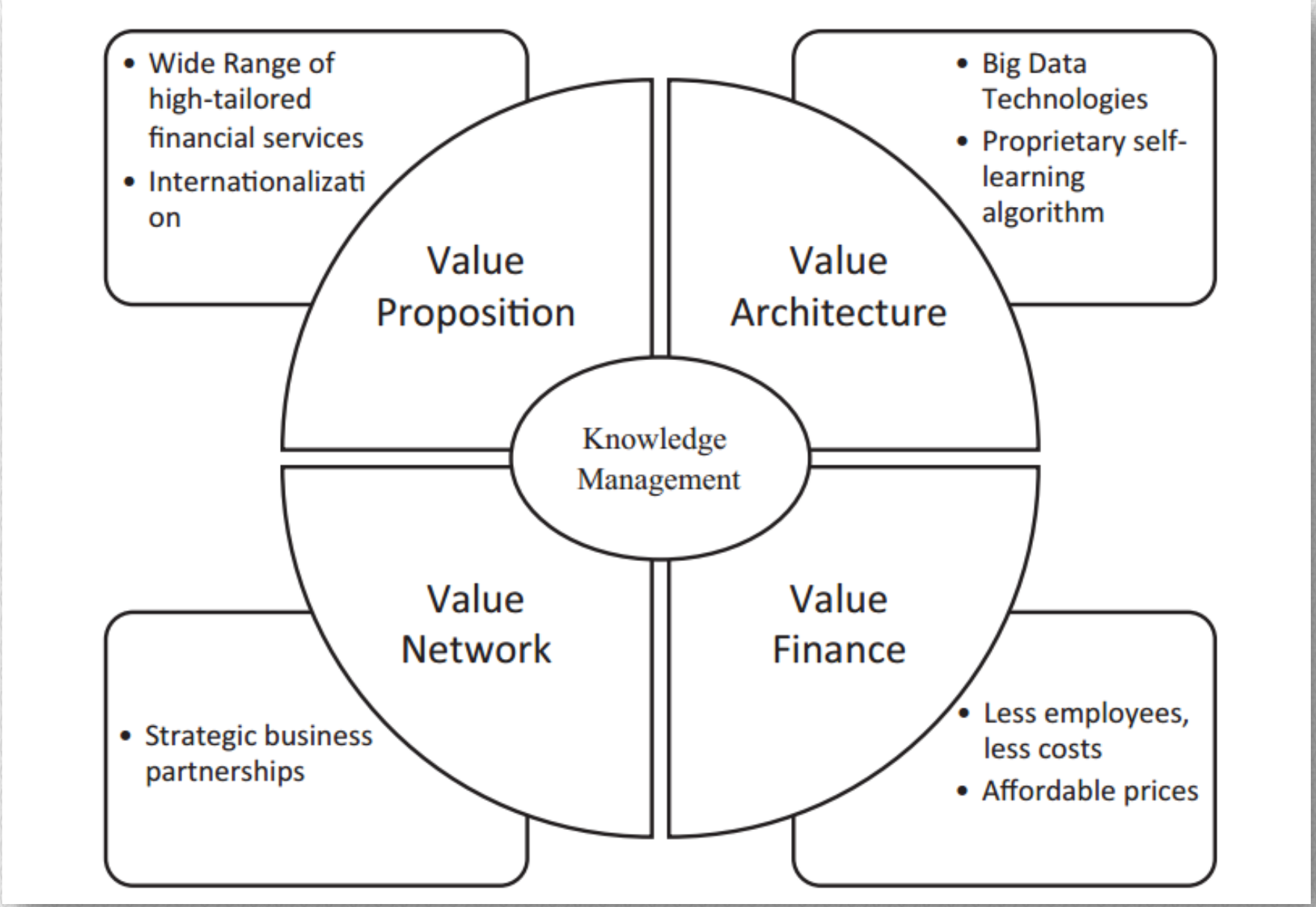
Organizational Innovation: Social Networks

Social technologies are digital technologies used by people to interact socially and together to create, enhance, and exchange content.

- They are enabled by information technology.
- They provide distributed rights to create, add, and/or modify content and communications.
- They enable distributed access to consume content and communications.

Business Model Innovation: Robots

- It is not easy to discern BMIs and single product or process innovation when dealing with fintech initiatives.
- A robot is a technology or technology-enabled process that can perform functions previously only performed by persons.
- Robo-advisors as a definite class of financial advisors that provide online services with minimal person intervention.


• Wide Range of high-tailored financial services
• Internationalizati on
Value Proposition
• Big Data Technologies
• Proprietary self-learning algorithm
Value Architecture
Knowledge Management
Value Network
• Strategic business partnerships
Value Finance
• Less employees, less costs
• Affordable prices

Business Model Innovation: Robots

Robotic Process Automation (RPA) is the application of technology that allows a company to configure computer software or a robot to capture and interpret existing applications for processing a transaction, manipulating data, triggering responses, and communicating with other digital systems.

KPMG Magna is an integrated environment in which an ongoing picture of traders' behavior can be effectively, efficiently, and economical monitored to detect early warning, daily activity risk signs. Using KPMG member companies' experience and understanding of the risks of trader misconduct (gained from hundreds of different fraud investigations), leading behavioral change technology, and user interface, KPMG helps customers to transform their compliance monitoring function. Doing this facilitates the prevention and early detection of unauthorized trading incidents, as well as reduces costs in reacting to internal investigations - which can be disproportionately high when there is regulatory scrutiny.

Classifications of a FinTech Initiative

- Where (1): where are fintech firms located?
- Where (2): what kind of owners are fintech firms from?
  - Startups;
  - Traditional financial institutions, such as banks or insurance companies;
  - Technological or retail companies moving into financial services;
  - Advanced startups with a mixed ownership.

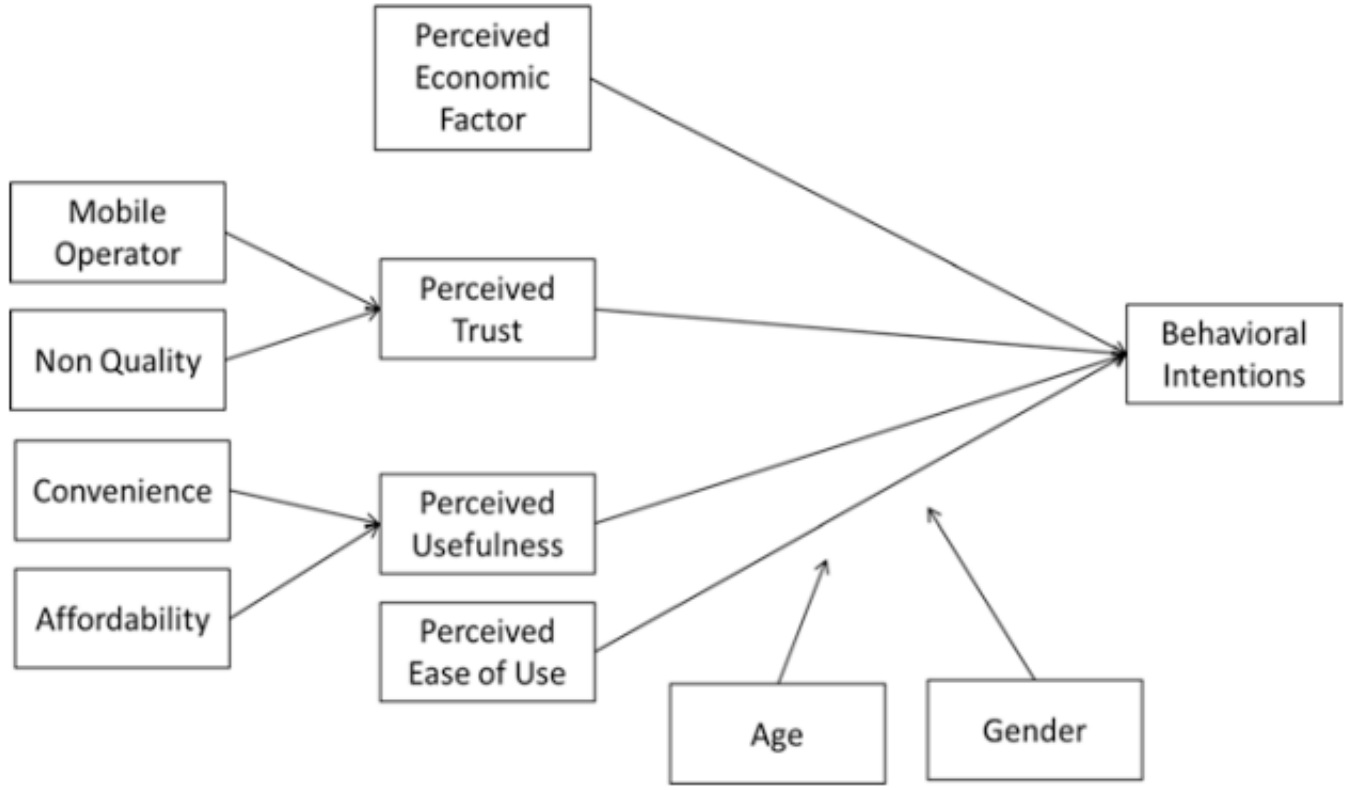


Fig. 4.11 The extended technology acceptance model

ASSIGNMENT 1.

What is your innovation idea to the finance industry? What is the business model?

ASSIGNMENT 2.

Familiarize yourself with:
Chen, Mark A., Qinxi Wu, and Baozhong Yang. “How Valuable Is FinTech Innovation?." *Review of Financial Studies* (2019).