

FinTech Solutions

Prepared by Dr. Mohamed Sleem

FNT611
Foundations of FinTech

Lecture 5



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Lecture 3 Discussion Questions:

Discuss the role of Artificial Intelligence (AI) and Machine Learning (ML) in the transformation of the financial sector. Use specific examples from credit scoring, fraud detection, customer service, and trading to illustrate their impact.

Answer: Artificial Intelligence (AI) and Machine Learning (ML) are crucial in the FinTech industry, providing personalized financial advice, regulatory compliance, predictive analytics, natural language processing (NLP), and cybersecurity. AI helps predict market trends, NLP analyzes unstructured text data, and ML enhances cybersecurity by detecting and responding to cyber threats, making them essential tools in the financial sector.

Lecture 3 Discussion Questions:

What are robo-advisors and Wealth-Tech, and how do companies like Betterment, Wealthfront, and Personal Capital exemplify their impact on the FinTech sector?

Answer: Robo-advisors are digital platforms offering automated financial planning using algorithms with minimal human intervention, while Wealth-Tech focuses on using technology to optimize wealth management, including investment strategies and financial advice. Companies like Betterment and Wealth-front are leading robo-advisors that use AI-driven algorithms to curate investment portfolios based on individual preferences. On the other hand, Wealth-Tech platforms like Personal Capital amalgamate financial data and provide investment insights through digital channels, refining financial planning and wealth management.

Lecture 3 Discussion Questions:

What is crowdfunding, and how has its role in the FinTech sector evolved as an alternative to traditional financing methods like VC funding?

Answer:

Crowdfunding is a method of gathering capital from a large pool of individuals, mainly through online platforms. In the FinTech sector, it has emerged as a significant alternative financing source, challenging traditional avenues like Venture Capital funding by offering a more accessible and efficient way for entrepreneurs and startups to raise funds.

Learning Objectives:

1. Understand how contemporary FinTech solutions strategically aid banks in maintaining their prominence in financial services.
2. Operational Efficiency and Compliance: Explore solutions that help traditional players become more streamlined, compliant, and efficient in their operations.
3. Security and Holistic Trading Decisions: Delve into technologies that bolster security and equip companies with comprehensive trading decision-making tools.

Learning Objectives:

- 4. Familiarize with disruptive B2C business models in the FinTech landscape, like crowdfunding and global remittance payments.**
- 5. Highlight solutions tailored for small businesses, aiding them in financial management and growth.**

Introduction:

- In today's rapidly evolving digital landscape, businesses are seeking greater efficiency, transparency, and collaboration in their operations.
- The B2C giants like Amazon and Alibaba have set a high standard for seamless consumer experiences, pushing the B2B domain to adapt and innovate.
- As businesses aspire for fluid transactions and seamless collaboration, B2B commerce networks have emerged as promising solutions.
- However, the path to true digital transformation in the B2B sector is fraught with challenges and inefficiencies that need addressing.

Types of Business:

1. Business-to-Business (B2B)

- Transactions between businesses, typically involving manufacturers, wholesalers, or retailers.
- Examples: Alibaba (for wholesale trade), SAP Ariba (procurement solutions).
- Characteristics: High-volume sales, long sales cycle, bulk discounts.

2. Business-to-Consumer (B2C)

- Transactions between businesses and end consumers.
- Examples: Amazon, Walmart's online store.
- Characteristics: Direct sales to consumers, quick sales cycle, broader target market.

Types of Business:

3. Consumer-to-Consumer (C2C)

- Transactions between consumers, usually facilitated by a third-party platform.
- Examples: eBay, Craigslist.
- Characteristics: Individual sellers, vast product variety, negotiation often possible.
Examples: E-filing of tax returns, payment for utilities or municipal fees online.
- Characteristics: Simplification of processes, public sector efficiencies.

4. Consumer-to-Business (C2B)

- Transactions where consumers sell their products or services to businesses.
- Examples: Stock photo websites where photographers sell photos to businesses.
- Characteristics: Dynamic pricing, consumers set the price or lead the transaction.

Types of Business:

5. Business-to-Administration (B2A)

- Transactions conducted between companies and public administration or government agencies.
- Examples: E-learning platforms, tax filing platforms.
- Characteristics: Services that businesses provide based on government requirements.

6. Consumer-to-Administration (C2A)

- Transactions between individuals and public administration.
- Examples: E-filing of tax returns, payment for utilities or municipal fees online.
- Characteristics: Simplification of processes, public sector efficiencies.

Complex Commerce in B2B

- **Established B2C vendors: e.g., Amazon & Alibaba**
- **Need for B2B: Integrated procurement workflows & sales platforms.**
- **Consumer-like experiences in B2B are needed.**
- **Rise of B2B commerce networks for automation, efficiency, & transparency.**
- **Transition to the cloud & mobile applications.**
- **73% enterprises believe in enhancing collaboration between B2B buyers & suppliers.**
- **Differences: Decision-making, purchase channels, volume, relationship-dependence.**
- **Challenge: B2B payments with many variables.**

B2C vs. B2B Transactions

B2C Online Purchase:

- **Fixed prices across multiple sites.**
- **Simple order and delivery process.**

B2B Transactions:

Complex due to taxation, varying prices, and special offers.

- **Shipping complexity with multiple products.**
- **Geography factors: Time zones, shipping distances, customs, cultural business expectations.**

Payment Complexities in B2B

Post-payment Changes:

- **60% require manual intervention.**
- **Over 30% of invoices are paid late by 30 days or more.**

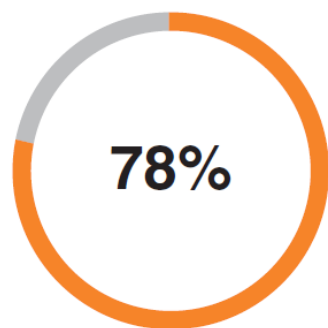
Data Issues:

- **Current payment systems lack adequate data description space.**
- **Cross-border transactions face data loss issues.**

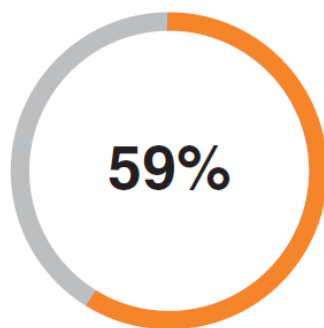
Business Impacts:

- **Cash flow is unpredictable.**
- **Both buyers and suppliers face challenges due to lack of accurate transaction info.**
- **78% of businesses cannot accurately forecast cash flow.**

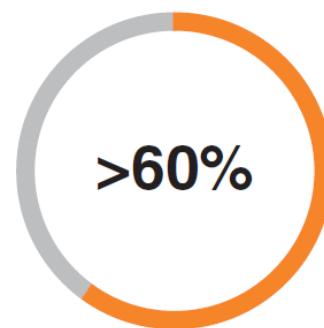
The Payment Problem



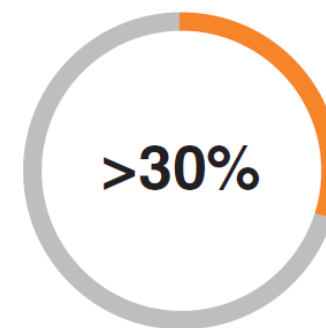
OF COMPANIES CAN'T
FORECAST SHORT-TERM
CASH FLOW WITHIN
5% ACCURACY



OF CFOS REPORT ISSUES
CAUSED BY POOR
VISIBILITY AND CONTROL
OF SUPPLIER PAYMENTS



OF PAYMENTS ARE
HANDLED MANUALLY
CAUSING UP TO 25%
PAYMENT MISMATCHES



OF B2B INVOICES ARE
PAID AFTER THE DUE
PAYMENT PERIOD AGREED
(USUALLY 30 DAYS)

Figure: Ironically, in today's 24/7/365, uber-connected era of business, most businesses still have little control or visibility of the status of their payment processes – and the consequences are staggering

A Broken Banking System for B2B Remittance

- **Antiquated Systems:** Many banks still use outdated systems for B2B payments.
- **Lack of Competition:** Little innovation due to few competitors in the market.
- **Global Inconsistencies:** Non-standardized banking models worldwide.
- **Poor Collaboration:** Fragmented structures impair visibility and inter-bank collaboration.
- **Inadequate Services:** Current services don't match B2C e-commerce convenience.
- **Loss of Transparency:** B2B networks often lack clarity, leading to lost data and payment challenges.
- **Static Payment Methods:** Methods like credit cards, wire transfers, and ACH transactions are not flexible for dynamic B2B needs.

The Rise of Dynamic Payments in FinTech

- **FinTech Innovations:** Creating payment platforms as dynamic as global business.
- **Startup Collaborations:** Partnering with enterprises to streamline B2B payment processes.
- **From Static to Dynamic:** Addressing the challenge of static payments in a dynamic digital marketplace.
- **Dynamic Payment Characteristics:** Faster, safer, and smarter transactions.
- **Real-time Systems:** Execution, clearance, and settlement of payments in real-time.
- **Marrying Technologies:** Combining secure digital banking, rich electronic data interchange, and modern cloud-based technologies.
- **The B2B Goal:** Merging existing services to achieve dynamic, event-driven payments.

The Rise of Dynamic Payments in FinTech

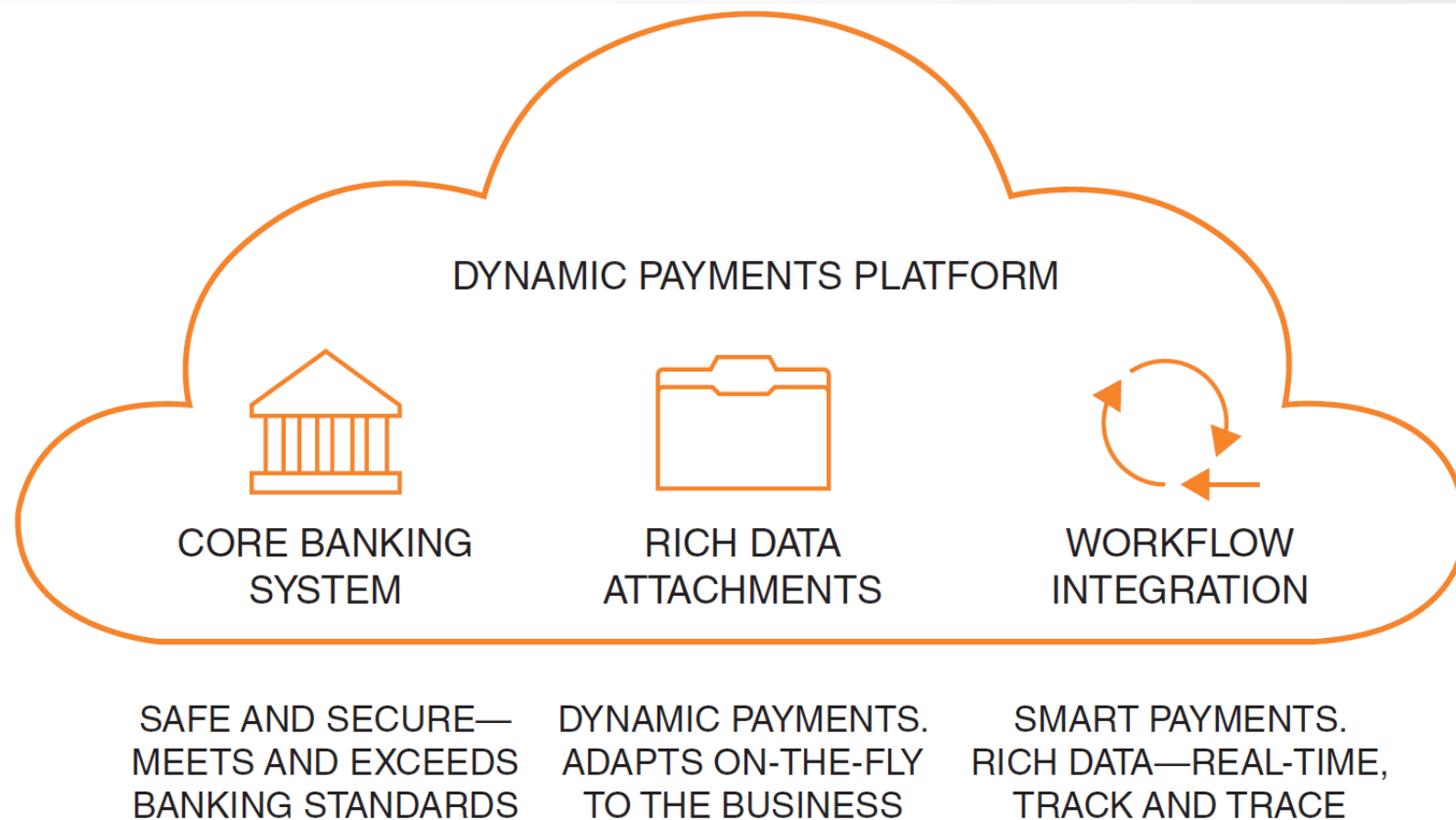


Figure: Elements of a dynamic payments platform

Dynamic Payments: The Future of B2B Commerce

- 1. Empowered Transactions:** Software solutions adapt to exceptions after payments, offering a comprehensive view of the entire transaction.
 - Features:* Supply chain financing, dynamic discounting, cash auctioning, and more.
- 2. Unified Integration:** Event-driven workflow engines link with existing B2B systems.
 - Advantage:* Real-time adaptation to transaction changes, synchronized details.
- 3. FinTech Innovation:** Payments aren't isolated steps but integrated parts of the commerce journey.

Dynamic Payments: The Future of B2B Commerce

4. Business Benefits: Early adopters experience improved capital management, liquidity, and cash flow.

- *Impact:* Removal of major barriers in traditional B2B operations.

5. The Bigger Picture: This innovation is a segment of the broader evolution in e-commerce.

- *Future:* Continuous redefinition of commerce by modern FinTech pioneers.

The Three Pillars of a Financial Transaction

- 1. Customer:** Essence: Consumers decide where and when to swipe. Power is in their hands. If they don't swipe, the whole system stops.
- 2. Bank:** Situation: Perceived as charging with no value-add. Vulnerable to disruptors using blockchain, offering lower fees, and having less overhead. Survival Strategy: Differentiate with valuable services to both merchants and consumers on top of the existing ones.
- 3. Merchants:** Needs: More profit, new customers, lower measurable costs. Ultimate Goal: Make customers happy, turn them into advocates, and establish an emotional ties. Customer experience is paramount.

Building Blocks of the New Bank

1. **POS as the Preferred Touch-point:** Banks own key consumer-business touch-point. Hold emerging smart POS devices (e.g., Poynt) for modern customer interaction.
2. **Data:** Banks have unique insight into customer context in physical settings.
3. **B2B2C Automated Personalization SaaS for Merchants and Consumers:** Essential for transforming obsolete systems into indispensable ones. It's about loyalty to consumers to gain merchant attention.

The era demands banks to evolve rapidly, or tech giants will seize the opportunity.

Predictive Algorithms in Online Banking

Post-financial Crisis: Rise in non-performing loans due to weak financial literacy.

Solution Proposition: Convert historical transaction data into cash flow forecasts. Assist customers in understanding future cash scenarios (life events or financial goals). Use data for actionable insights and contextual product offerings.

Innovation Imperative (2015): Companies need chief innovation officers. Innovation is a crucial driver for success.

Banking Sector: Traditional model is challenged by FinTech's. Transition from product-driven to innovation-driven approach. Need to shift from free consultancy to a paid model due to economic conditions.

Customer Transformation: Previously: Heavy reliance on bank advisors due to financial illiteracy. Now: Empowered with online resources but still face challenges, leading to increased NPLs.

Example: Simple Algorithm - Loan Default Prediction

1. Input:

Customer's monthly income (income)

Customer's monthly expenses (expenses)

Number of existing loans (num_loans)

Previous loan defaults (previous_defaults)

Amount of the new loan requested (loan_amount)

2. Steps:

Calculate Disposable Income:

$\text{disposable_income} = \text{income} - \text{expenses}$

Check Previous Defaults:

If $\text{previous_defaults} > 0$, then:

Predict "High Risk of Default"

Exit

Example: Simple Algorithm - Loan Default Prediction

Check Disposable Income:

If $\text{disposable_income} < \text{loan_amount} / 12$ (assuming a 1-year loan repayment), then:

Predict "Moderate Risk of Default"

Else:

Go to next step

Check Number of Existing Loans:

If $\text{num_loans} > 3$, then:

Predict "Moderate Risk of Default"

Else:

Predict "Low Risk of Default"

3. Output: Prediction result - "High Risk", "Moderate Risk", or "Low Risk" of loan default.

Predictive Algorithms in Online Banking

Example Online Banking in Austria

Austria is relatively well-developed when it comes to banking, and online banking statistics are similar to most Central and Western European markets. As an example, Austria's largest bank, the Raiffeisen Banking Group, has 1.6 million online banking customers. Out of 700,000–800,000 daily contacts, the bank is already handling 25 percent of them originating from mobile devices.¹

In the European Union, out of 507 million citizens, 85% are bank customers,² of whom 44% use online banking.³ According to author interviews with bank representatives, approximately 10% of online banking users are “power users”

who regularly use advanced features and act as early adopters. Taking these early adopters as a target group of online banking innovation, there is a 20 million target group in the 28 EU Member States.

The Austrian market leader in online banking innovation at the moment is ERSTE Group who recently launched their new online banking service “George”, and combine the largest bandwidth of functionality. Additionally, banks are experimenting with multi-channel strategies, such as account opening via email and phone or financial advice via video-conferencing (see Table below).

Applying Predictive Analytics to SMEs

- **Aims to improve decision-making.**
- **Helps beating financial illiteracy.**
- **Provides better visualization and understanding of complexities.**
- **Interfaces with external data sources such as:**
 - **Utilize Macroeconomic data.**
 - **CRM/ERP/accounting systems.**
- **Impact of these Predictive Methods:**
 - **Affects consultants, tax accountants, and in-house staff.**
 - **For banks, it can influence funding instrument pricing and risk pricing**

The Importance of Contract Management in Financial Institutions

- **Background:** Decades of oversight are culminating in challenges for financial institutions. Inadequate management of contracts has severe consequences, as seen with Lehman Brothers and AIG.
- **The Challenge:** During the financial crisis, institutions lacked a clear understanding of their contracts, leading to panic and disorganization.
- **Regulatory Response:** Global regulators, shocked, imposed strict requirements. The European Banking Authority, for instance, on 6 March 2015, introduced a standard for information on financial contracts, aligning it with the "living wills" requirement for pivotal financial institutions.
- **Purpose of Contracts:** Legal contracts define financial instruments through terms, conditions, and obligations. Their effective management is crucial for financial system stability.
- **The Irony:** While business lines adopted technology to scale, legal and documentation teams lagged, missing out on tools to manage growth.

The Role of FinTech in Transforming Contract Management

- **Regulation vs. Optimization:** While regulation (the stick) forces institutions to improve, there's an unrecognized business optimization potential (the carrot). Heavy fines are often due to neglect in managing contractual obligations, echoing a "too big to fail" attitude.
- **FinTech's Intervention:** FinTech has facilitated the creation of systems to store and manage legal data. Proper initial processes would've made things easier, but past neglect has required a different approach due to the volume of existing contracts.
- **Big Data & Contracts:** The attraction of big data lies in understanding relations within unstructured and structured data. The task isn't just about big data, but it forces legal teams to embrace disorder, taking on a data scientist role to find patterns.

The Role of FinTech in Transforming Contract Management

- **Digitization of Contracts:** Contracts are being digitized by financial firms using OCR, ICR, and IWR technologies. Even verbal agreements between traders are being digitized using speech recognition to avoid disputes.
- **Challenges in Digitization:** Issues like poorly defined tables in documents exist, but drafting with reliance on precedent documents and defined contract vocabulary simplifies the process.

Enhancing Legal Document Management with FinTech

- **1. Digitization & Classification:**

- Post-digitization, documents become searchable.
- Solves issues due to poor classification and filing during execution.
- Mapping with other data systems reduces problem size by focusing on actual risks.

- **2. Beyond Finding Contracts:**

- Parallel: IBM's Deep Blue & Watson show AI's potential.
- Old computing: procedural "if A, then B" automation.
- New FinTech approach: interpretative capabilities that evolve with data and human guidance.

Enhancing Legal Document Management with FinTech

3. Techniques Leveraged:

- Correlation: Focuses on high-risk areas by identifying useful proxies.
- Validation: Ensures consistency and reveals errors often missed in manual reviews.
- Positive Feedback: Uses text analytics to provide detailed structured data, emphasizing the role of legal terms as data.

4. Benefits & Impact:

- Enhanced understanding of financial instruments and contractual nuances.

Behavioural Biometrics – A New Era of Security

The Changing Digital World & Security Challenges

- The rise of mobile and global interactions in business and personal life.
- Traditional security methods becoming inadequate for digital assets.
- Increasing incidents of identity theft and hacking threats.

Behavioral Biometrics – A New Era of Security

Evolution of Biometrics for Security

- Traditional biometrics: Fingerprint, iris scan, etc.
- Behavioral biometrics: Focusing on user behavior, like typing rhythm, swipe patterns, and interaction techniques.
- Seamless, transparent, and continuous verification.

Behavioural Biometrics – A New Era of Security

- **Benefits of Behavioural Biometrics**

- Suited for mobiles due to rich data from sensors.
- Makes authentication a natural part of the user experience.
- Continuous validation ensures user is genuine throughout the session.

Behavioural Biometrics – A New Era of Security

Balancing Security with User Experience

- Increasing demand for fast and frictionless transactions.
- Importance of context-based security: Right level of security for the right task.
- The psychology of user perception: Need for occasional visible security reassurance.

Behavioral Biometrics – A New Era of Security

The Future of Banking & Security

- Banks becoming more customer-centric.
- Need for unobtrusive, rigorous security that doesn't interrupt user experience.
- Predictions: Banks will organize around customers, not products or channels.

Disruption, SMEs, and Payment Solutions

Understanding Disruption:

- Definition by Clayton M. Christensen: New markets emerge through disruptive technologies.
- Disruption vs. Competition: Changing game rules.
- Current financial giants: Immense power, influence, and regulatory control. Leads to lack of competition, affecting consumers.

Disruption, SMEs, and Payment Solutions

SMEs & FinTech Revolution:

- SMEs: Globally responsible for 80% of economic activity. In Australia, they make up 97% of businesses and employ 47%.
- Melbourne: Hub for FinTech start-ups serving SMEs due to government initiatives.
- Key Tools for SMEs:
 - FinancialAsk: Online financial advice.
 - Boomerango: Budgeting and cash flow management.
 - Moula: Alternative lending for Australian SMEs.

Predicting Trading moves via Data mining Techniques

- 1. Sentiment Analysis:** Text mining techniques enable sentiment analysis of news articles, social media posts, and financial reports. By gauging market sentiment, traders can anticipate market trends and make informed decisions.
- 2. Event Detection:** Text mining helps in detecting significant events such as mergers, acquisitions, earnings announcements, and economic indicators. These events can have an immediate impact on stock prices, and timely detection allows for proactive trading strategies.
- 3. News Analytics:** Text mining tools can extract valuable insights from large volumes of financial news. By identifying patterns and trends in news data, traders can anticipate market movements and adjust their portfolios accordingly.

Predicting Trading moves via Data mining Techniques

- 1. Risk Assessment:** Text mining assists in assessing the risk associated with specific assets or companies. By analyzing textual data, traders can uncover hidden risks and take preventive measures to mitigate potential losses.
- 2. Real-time Decision Making:** Text mining provides the ability to process and analyze news and social media data in real-time. This allows traders to react quickly to breaking news and make rapid trading decisions, capitalizing on market opportunities.

Summary

- **Operational Efficiency and Compliance:** solutions that enable traditional financial institutions to streamline their operations, ensuring compliance with regulatory requirements while enhancing overall efficiency.
- **Security and Holistic Trading Decisions:** technologies designed to strengthen security measures and equip companies with advanced tools for making well-informed trading decisions, considering a holistic approach.
- **Disruptive B2C Models:** within the FinTech landscape, such as crowdfunding and global remittance payments, highlighting their impact on the industry.
- **Small Business Solutions:** FinTech solutions tailored for small businesses, providing support for financial management and facilitating their growth.

For Discussion:

1. In the context of today's 24/7/365, uber-connected business environment, discuss the challenges and implications faced by companies regarding their payment processes.
2. How can predictive analytics benefit SMEs in terms of decision-making, and what are its impacts on consultants, tax accountants, in-house staff, and banks?
3. What are the different types of business models, such as B2B, B2C, C2B, C2A, C2C and B2A, and how do they differ from each other?



Thank You